VISION

To attain a distinct identity for the Institute through technology innovation, knowledge creation and dissemination for the benefit of the society.

MISSION

- To nurture an eco system for continuous enhancement of value based teaching and learning process in the emerging areas of technology.
- To train quality human and knowledge resources in the service of society.
- To develop sustainable products and technologies.

Motilal Nehru National Institute of Technology Allahabad

Prayagraj – 211004

INSTITUTE DEPARTMENTS

1. Department of Applied Mechanics
2. Department of Biotechnology
3. Department of Chemical Engineering
4. Department of Chemistry
5. Department of Civil Engineering
6. Department of Computer Science & Engineering
7. Department of Electronics & Communication Engineering
8. Department of Electrical Engineering
9. Department of Humanities and Social Sciences
10. GIS Cell
11. Department of Mathematics
12. Department of Mechanical Engineering
13. Department of Physics
14. School of Management Studies

Motilal Nehru National Institute of Technology Allahabad

Prayagraj – 211004

NOVEL CORONAVIRUS DISEASE
(COVID-19)

Ministry of Health & Family Welfare
Government of India

Help us to help you

THREE GOLDEN RULES

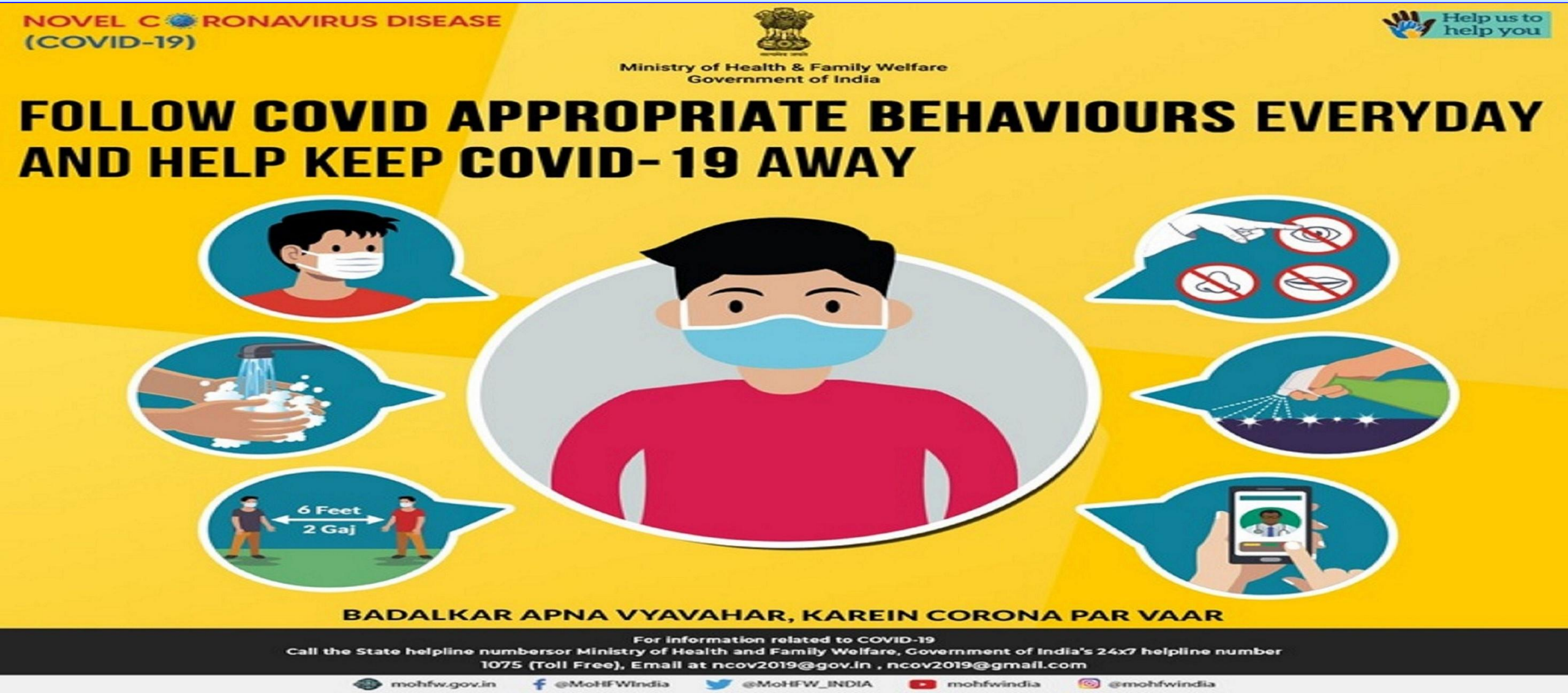
Always wear
Face-cover/mask

Wash hands frequently
and thoroughly
with soap and water

Maintain distance
from others

Motilal Nehru National Institute of Technology Allahabad

Prayagraj – 211004



Motilal Nehru National Institute of Technology Allahabad

Prayagraj – 211004

Department of Applied Mechanics

Dr. Anuj Jain

Ph.D., IIT Roorkee, India

Professor (HAG), Department of Applied Mechanics

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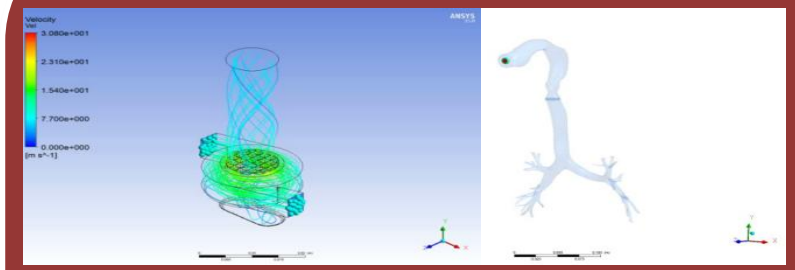
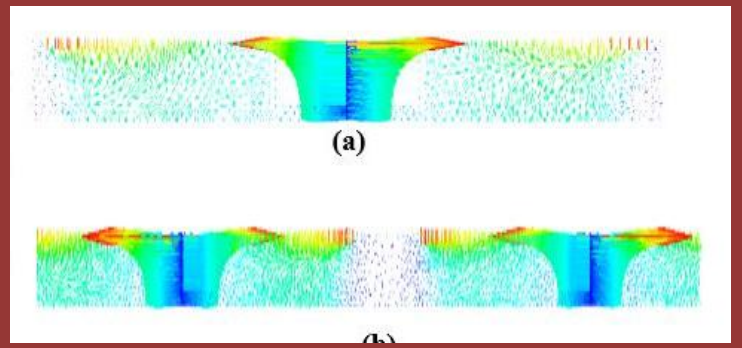
http://mnnit.ac.in/profile/anujjain

- **Experimental and Computational Mechanics**
- **Computational Fluid Dynamics**
- **Materials Engineering**

Equipment Performance Enhancement (Process/Aerospace)



Inhaler Development (BioMedical)



Material Processing (Defence)

Dr. Ravi Prakash Tewari

Ph.D., I.T.,B.H.U, India

Professor, Department of Applied Mechanics

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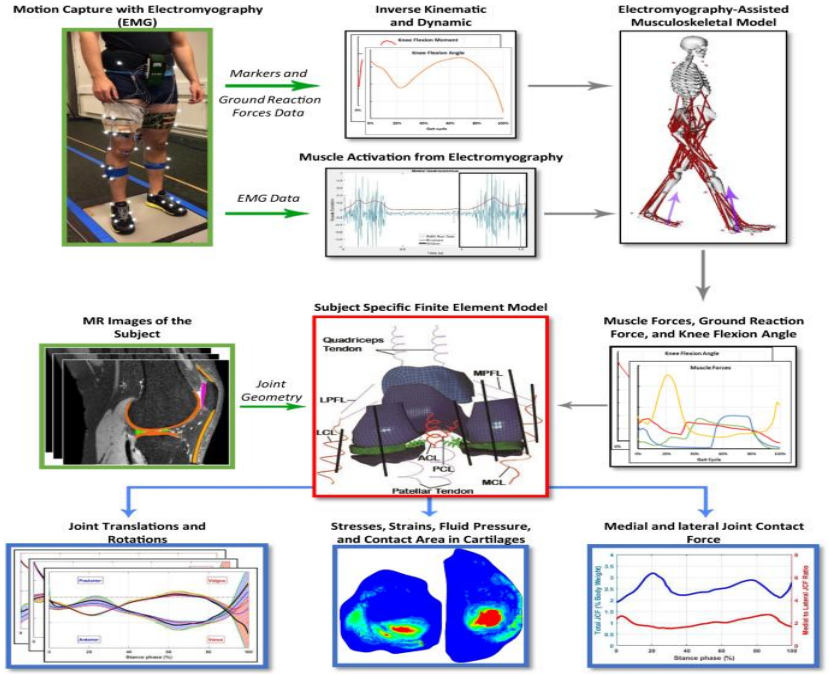
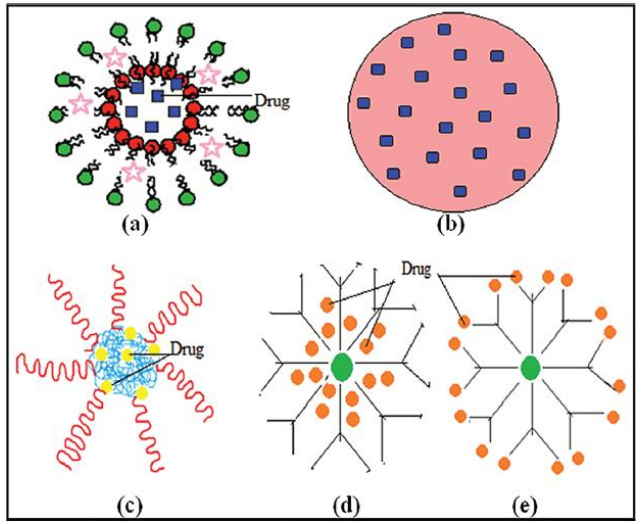
- **Biomechanics**
- **Robotics & Medical Devices**
- **Biomaterials & Nano Particles**



Biomechanics

Robotics & Medical Devices



Biomaterials & Nano Particles

Dr. S. J. Pawar

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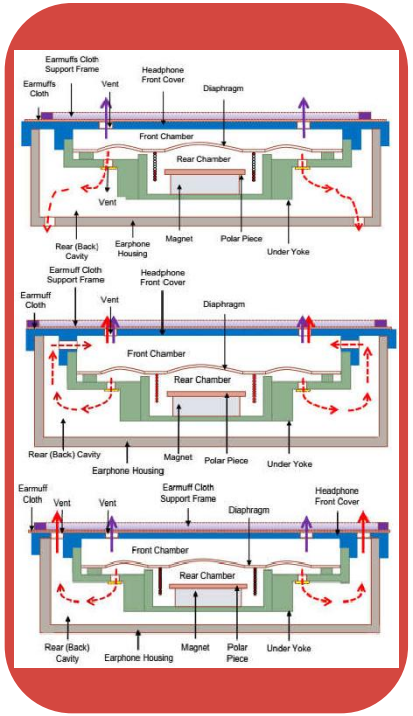
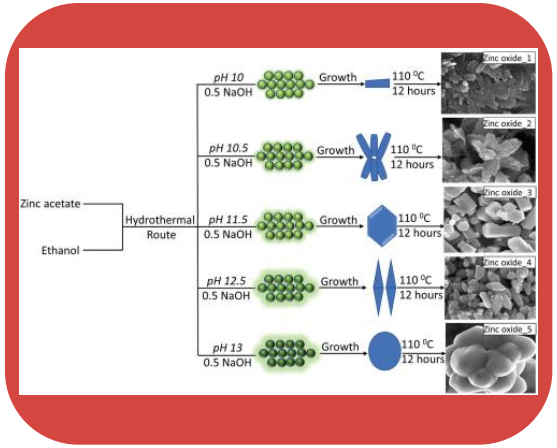
http://www.mnnit.ac.in

- Electroacoustic Transducers
- Nano-Bio Materials Synthesis and Characterization
- Composites
- Acoustics and Acoustic Materials

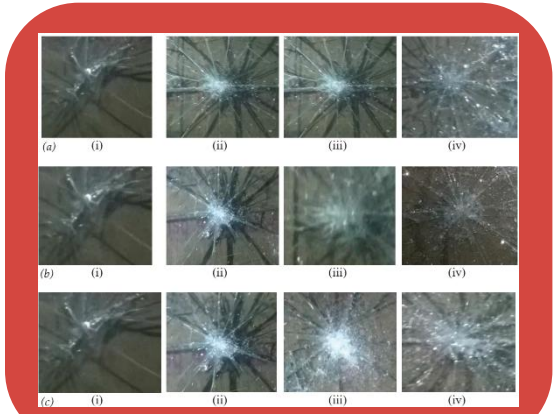


Schematics of Traditional Headphone and Modified Headphones in view of sound interactions



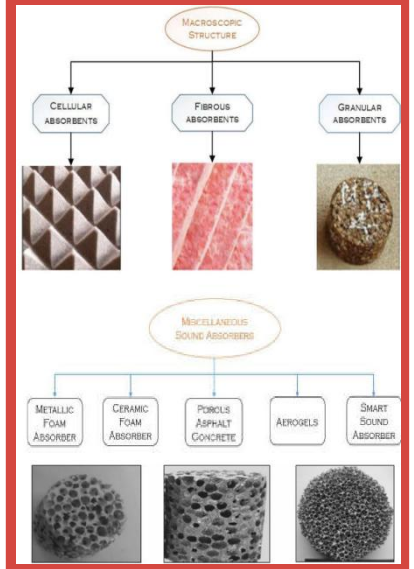
Flowchart for growth of five different morphologies of ZnO nanoparticles synthesized the hydrothermal route for biomedical applications

Materials Technology
Published online: 14 Sep 2021



Impact fracture of 10·38 mm, 10·76 mm, and 11·52 mm laminated glass (LG-PVB) from 490, 1200, 1450 and 1900 mm heights

Glass Technol.: Eur. J. Glass Sci. Technol. A,
December 2017, 58 (6), 169–178



Sound absorbing materials - Cellular Absorbents, Fibrous Absorbents, Granular Absorbents, and Metallic Foams

Acoustics Australia (2021) 49:69–82

J Porous Materials (2019) 26:1795–1819

Dr. Ramesh Pandey

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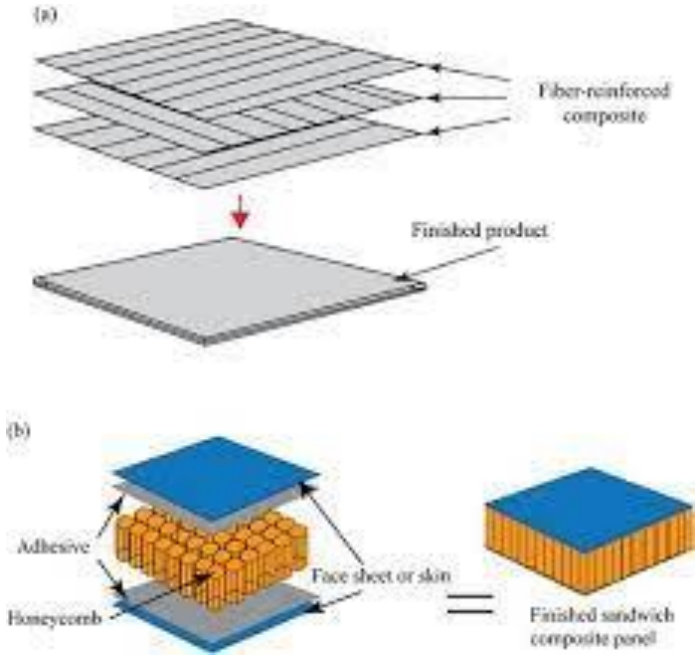
http://www.mnnit.ac.in

- Solid Mechanics
- Composite Materials & Structures
- Biomechanics & Artificial Intelligence



Dr. Abhishek Kumar

Ph.D., IIT Roorkee, India

Professor, Department of Applied Mechanics

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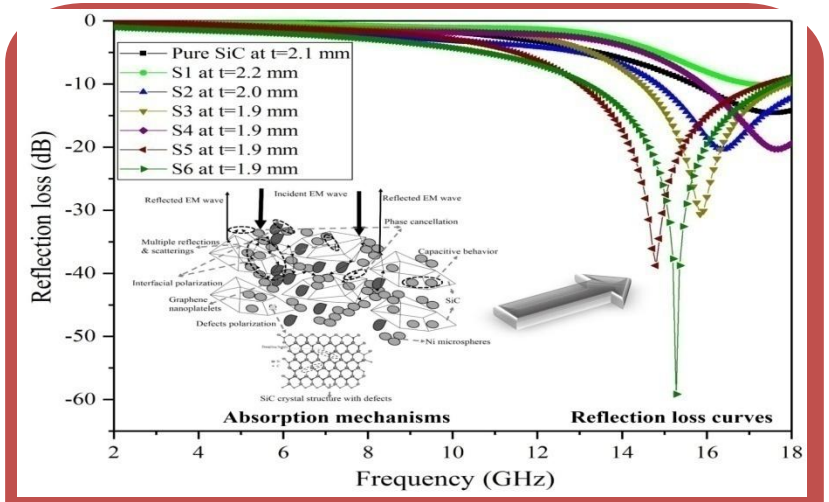
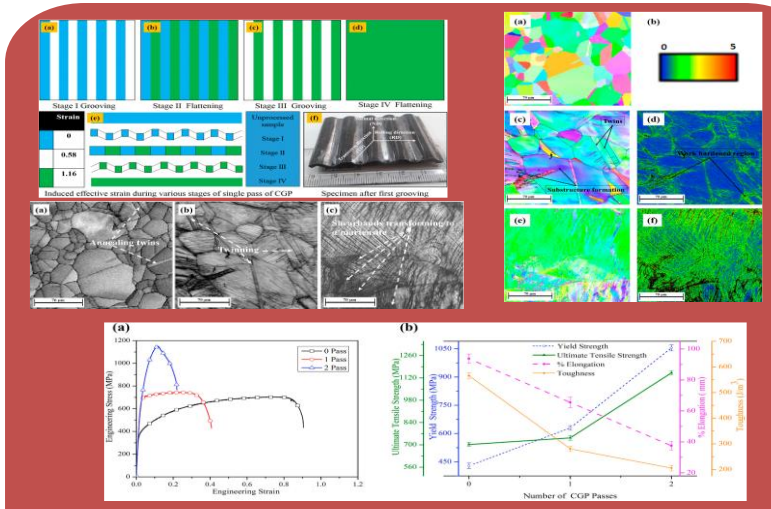
- **Design and development of microwave absorbers**
- **Mechanical and corrosion behaviour of metals and alloys**
- **Thermo-mechanical behavior of nano-filler dispersed polymers**



Stealth Application

(Microwave Absorbing Materials)

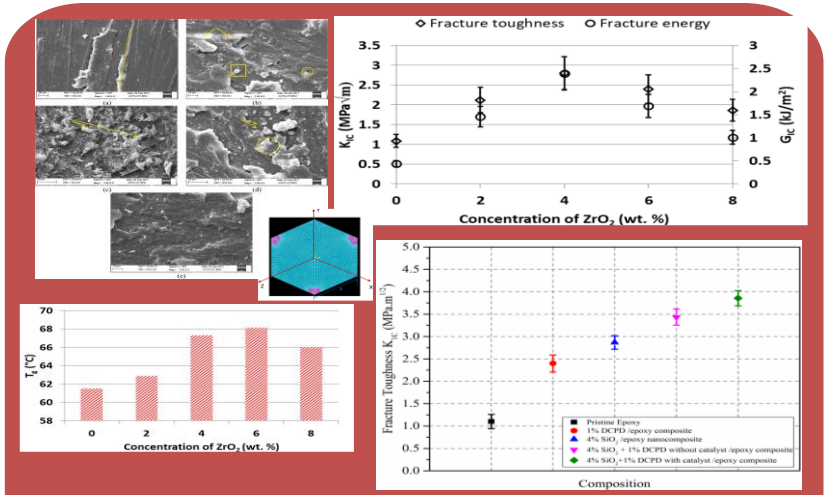
Kumar et. al. (2020) Journal of Alloys and Compounds, 823, 153780



Bulk Ultrafine Grained Materials

(Structural Application)

Kumar et. al. (2021) Materials Science & Engineering A, 812, 141105



Nano-filler Polymer Composites

(SMP and SMPC based)

Kumar et. al. (2022) Engineering Fracture Mechanics, 263, 108300

Dr. Akshoy Ranjan Paul

Ph.D., MNNIT Allahabad, India

Associate Professor, Department of Applied Mechanics

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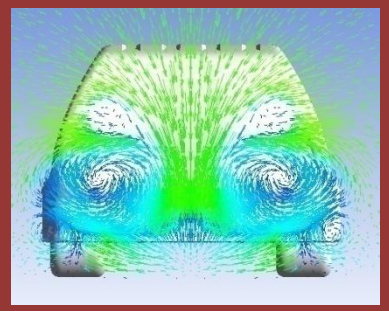
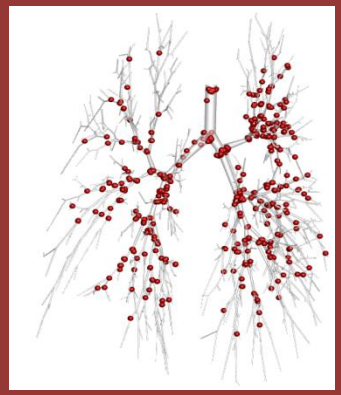
http://www.mnnit.ac.in

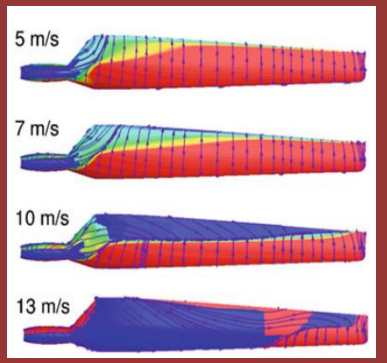
- **Fluid Mechanics & Heat Transfer**
- **Bio-Fluid Modeling**
- **Green Energy**



FLOW CONTROL & DRAG REDUCTION, HEAT TRANSFER AUGMENTATION



RESPIRATORY TRACT MODELING



WIND AND WAVE ENERGY HARVESTING, CLEAN COAL TECHNOLOGY

Dr. Ajaya Bharti

Ph.D., MNNIT Allahabad, India

Associate Professor, Department of Applied Mechanics

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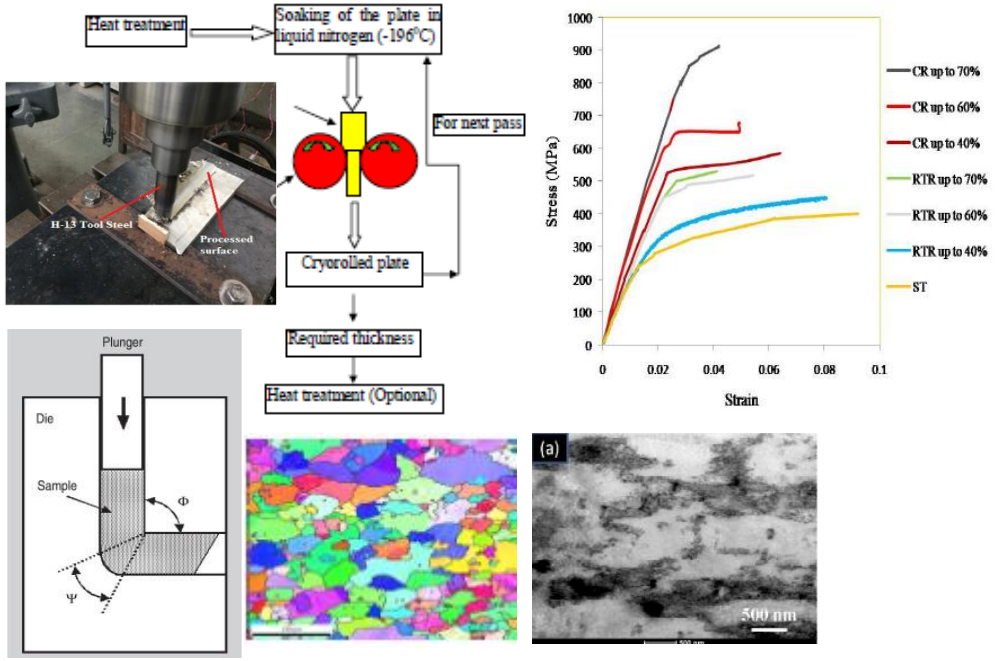
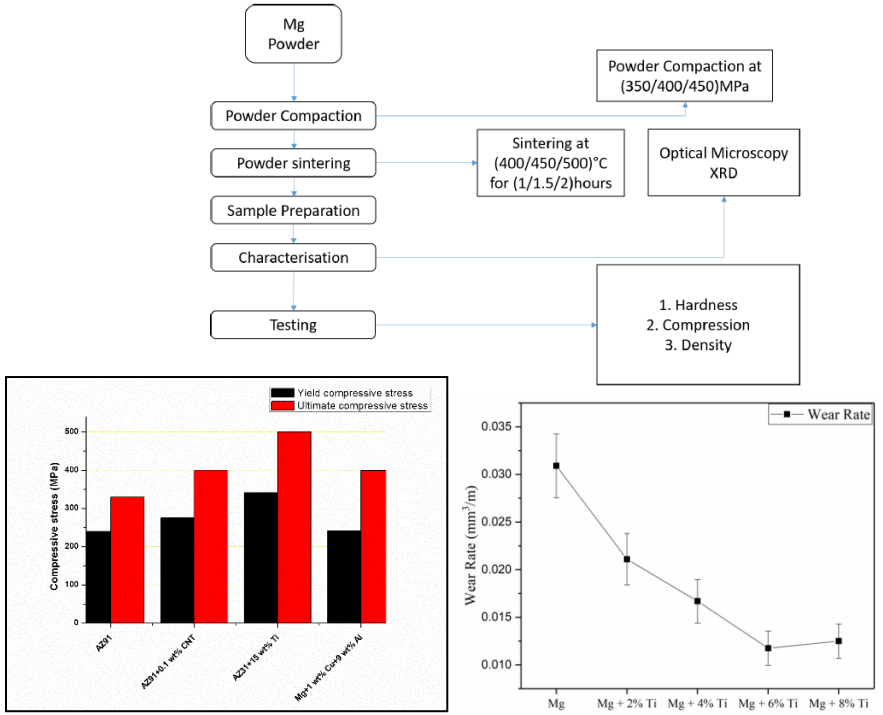
http://mnnit.ac.in/profile/abharti

- **Development of Ultrafine Grain Materials Through Severe Plastic Deformation/Study of Mechanical and Tribiological Behaviour**
- **Development of Advance Materials Through Powder Metallurgy/Study of Mechanical and tribiological Behaviour**



Severe Deformation Process, Microstructure and Mechanical Behaviour



Powder Metallurgy Process, Mechanical and Tribological Behaviour

Dr. Anindya Bhar

PHD, IIT Kharagpur, India

Associate Professor, Department of Applied Mechanics

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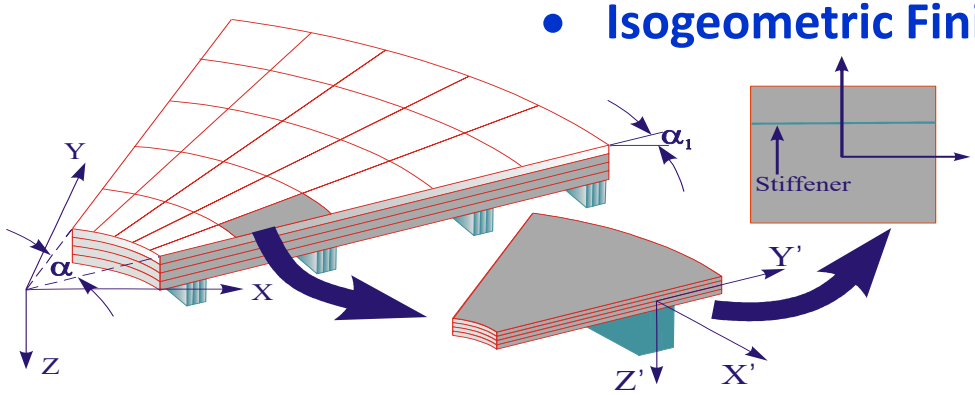
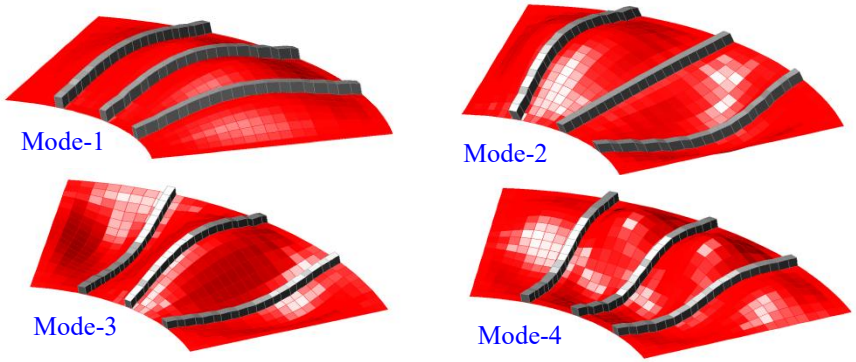
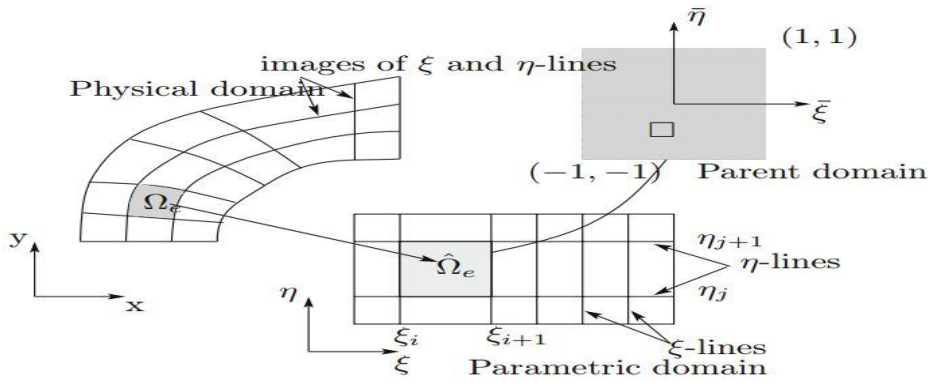
- **Analysis of Stiffened Plates / Panel Structures of Laminated Composites and Functionally Graded Materials**
- **Isogeometric Finite Element Analysis of Solids and Structures**



Mathematical and Computational Modeling & Analysis: Typical annular sector stiffened-plate Finite Element



Generated Results: Mode shapes of stiffened annular sector Functionally Graded Material plates



Advanced Technique: Scheme of Isogeometric Analysis

Application Area: Typical orthotropically stiffened highway bridge deck (Wikipedia)

Dr. V. Murari

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Associate Professor, Department of Applied Mechanics

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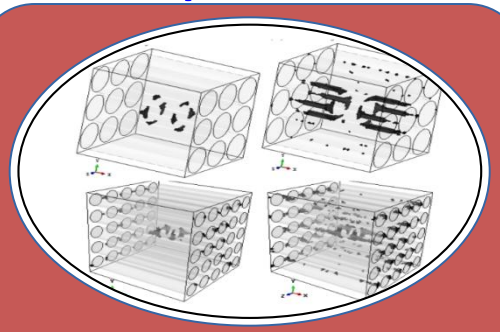
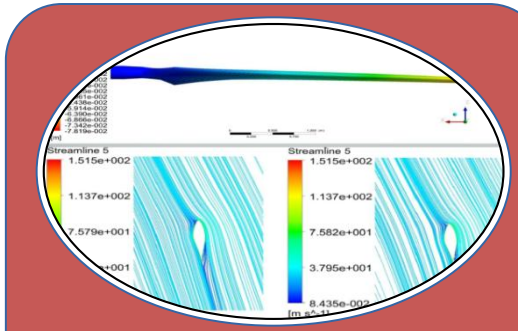
http://www.mnnit.ac.in

- **Micromechanics of Composites**
- **Mechanical/Damage response of Composites under static and dynamic loads**
- **Mechanics/Damage mechanics of Repaired and Recycled composites**
- **Composites as Energy Absorbers**

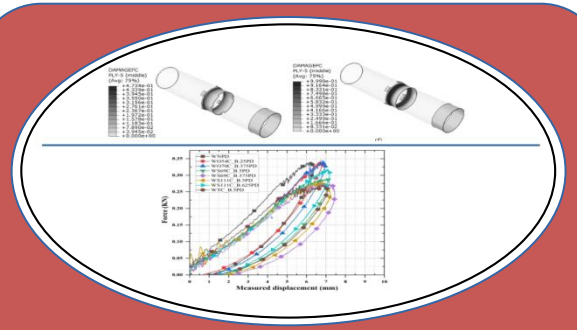


Effect of **micro-level** plasticity on **macro-level** response of composites: a micromechanics based study **(Computational)**

Evaluation of Fracture Toughness of Soft-Core **Sandwich Composites (Experimental)**



Effect of Bend-Twist Coupling on performance of Stall Controlled **Wind Turbine Blades (Computational)**



Top: Damage response of **composite tubes with plydrops (Computational)**
Bottom: Impact response of **composite plates with plydrops (Experimental)**

Damage modeling / mechanics of Composite Materials and Structures

Dr. A.K. Upadhyay

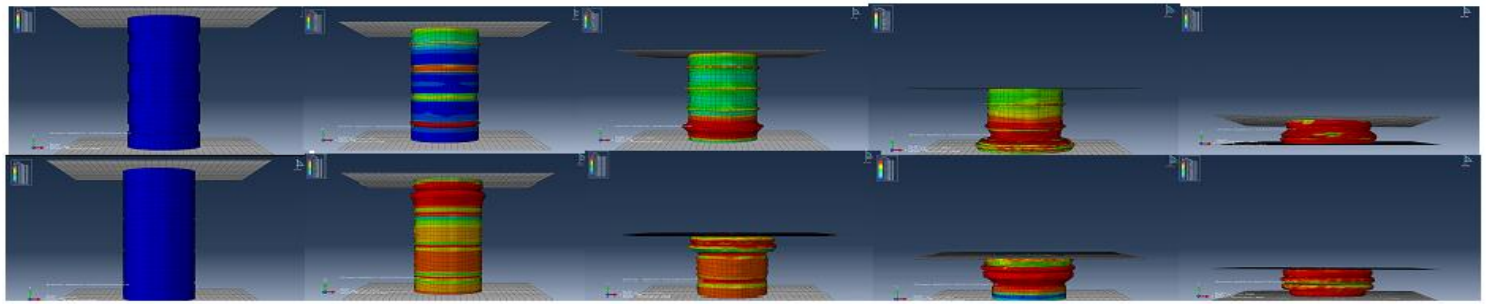
PHD, MNNIT Allahabad, India

Associate Professor, Department of Applied Mechanics

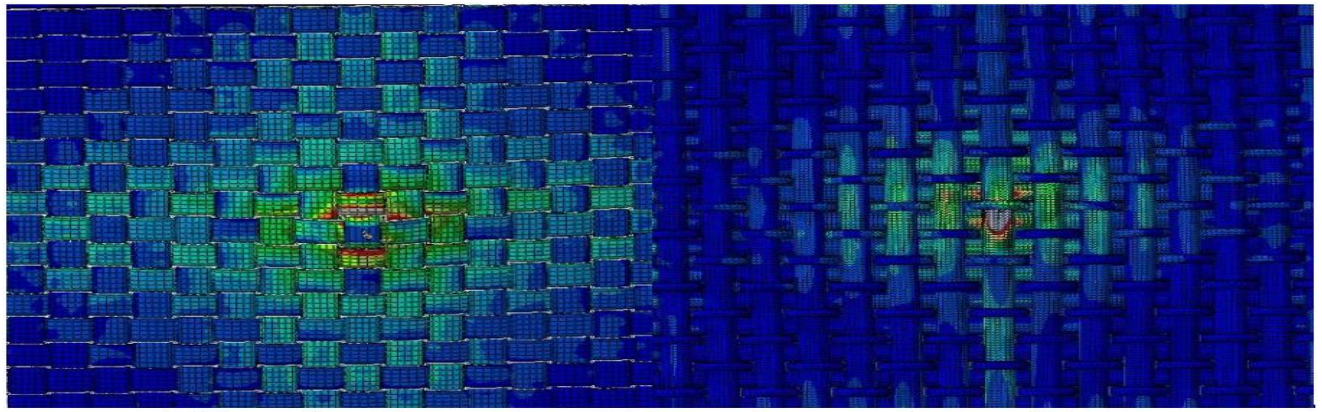
0532 227 1213; ashutosh@mnnit.ac.in

http://www.mnnit.ac.in

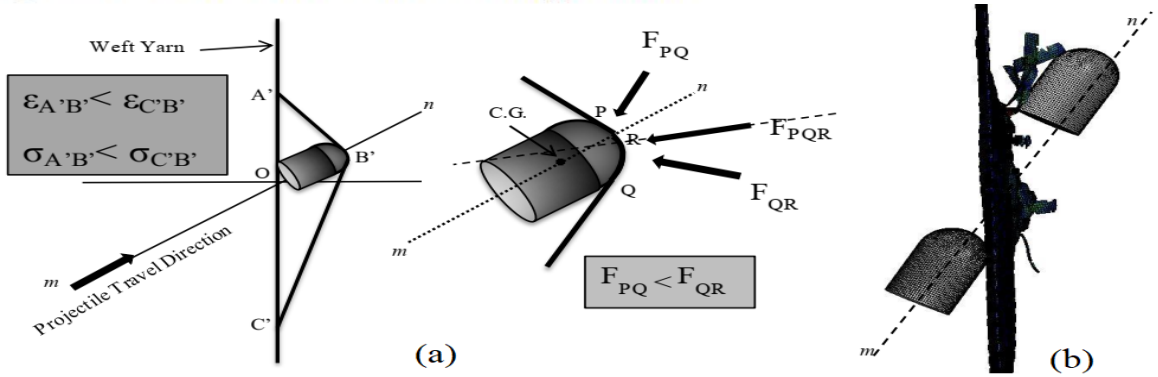
- **Composite Plates and Shells**
- **Low and High Velocity Impact**
- **Energy Absorbers and Crashworthiness**



Progressive and Simultaneous collapse mode in grooved tubes under axial compression



Effect of grading on the stabbing resistance of woven fabric



(a) Forces on a projectile during oblique impact and drifting of projectile (b)

Dr. Vivek Kumar Patel

Ph.D., IIT Delhi, India

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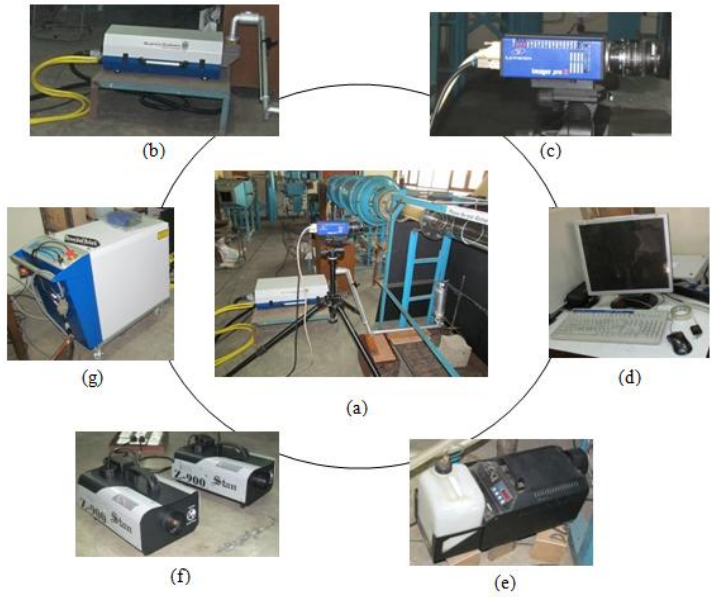
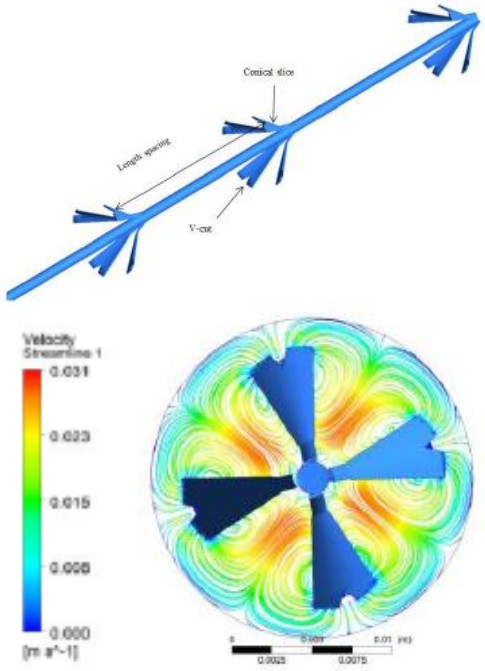
http://www.mnnit.ac.in

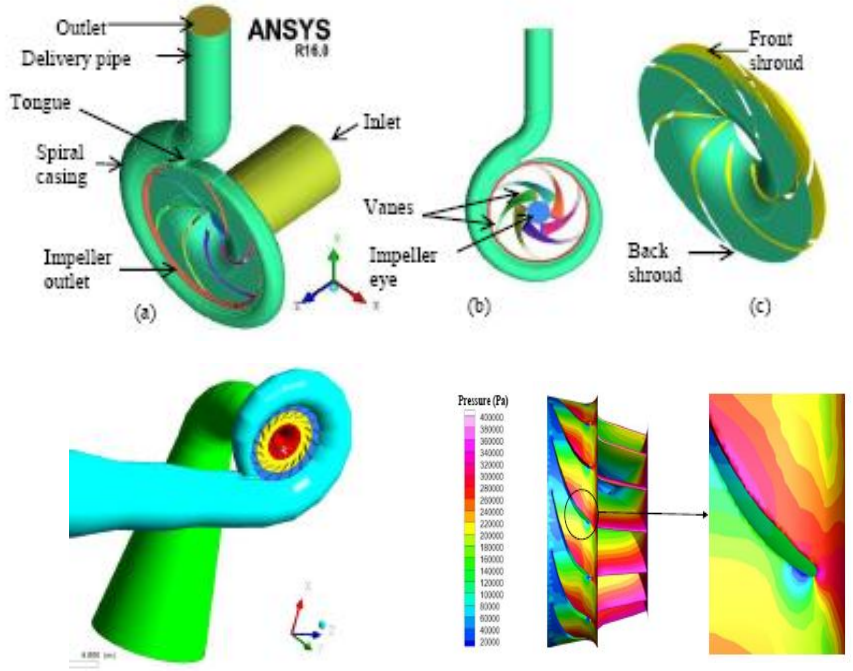
- **Experimental & Computational Fluid Dynamics**
- **Thermo-fluids Engineering**
- **Multi-Phase Flow**



PIV measurements on Heated Jets



Heat Transfer Enhancements using Tabulators



CFD Analysis on Pumps & Turbines

Dr. Ashutosh Mishra

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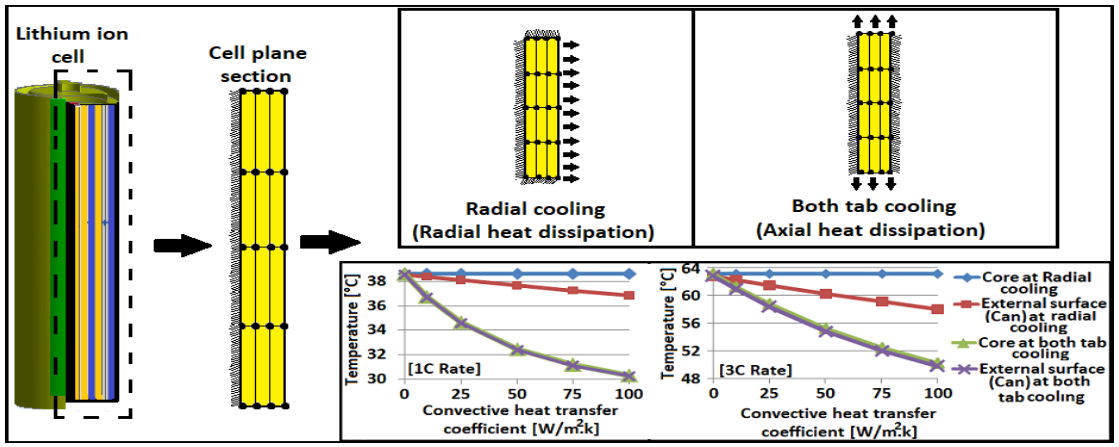
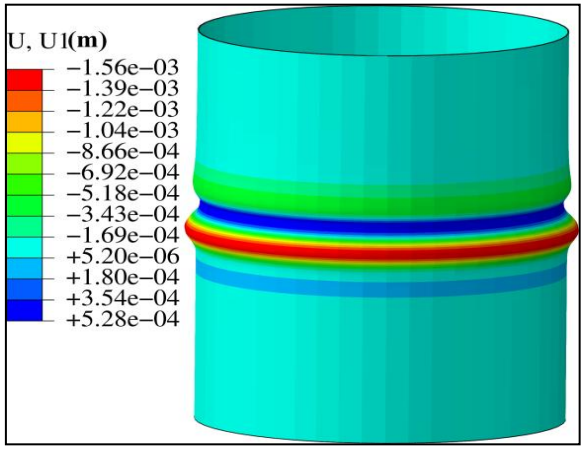
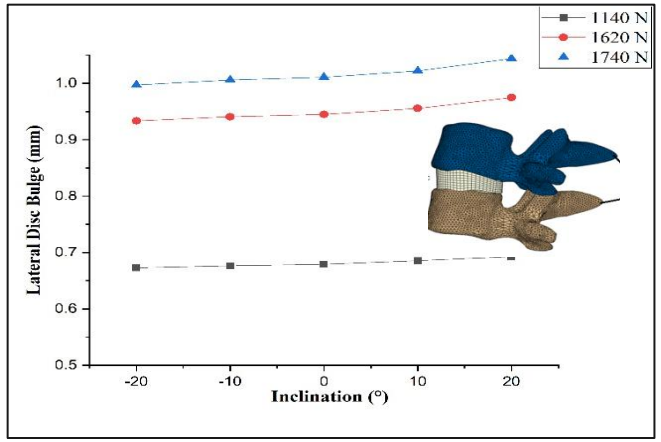
- **Battery electro -thermo-mechanical modeling and characterization**
- **Material modeling of metals, composites, and 3D printed parts**
- **Computational biomechanics and radiation modeling**



Identifying Efficient Cooling Approach of Cylindrical Lithium-ion Batteries (Ahmad, T., Mishra, A., Ghosh, S. and Casari, C.S., 2022. Energy Technology, 10(2), p.2100888)



Radial outward bulge in scaled down model of nuclear reactor due to thermal ratcheting phenomenon during different plant operating condition



Prediction of Intervertebral disc (IVD) bulge in human spinal unit-prediction during forward and backward bending

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- Smart materials
- Polymers and composites
- Additive Manufacturing

SHAPE MEMORY POLYMER FOR SMART ACTUATOR

MAGNETORHEOLOGICAL FLUID /GEL FOR DAMPING

ADDITIVE MANUFACTURING OF IMPLANTS AND COMPOSITE STRUCTURES

Smart materials characterization and analysis of smart devices

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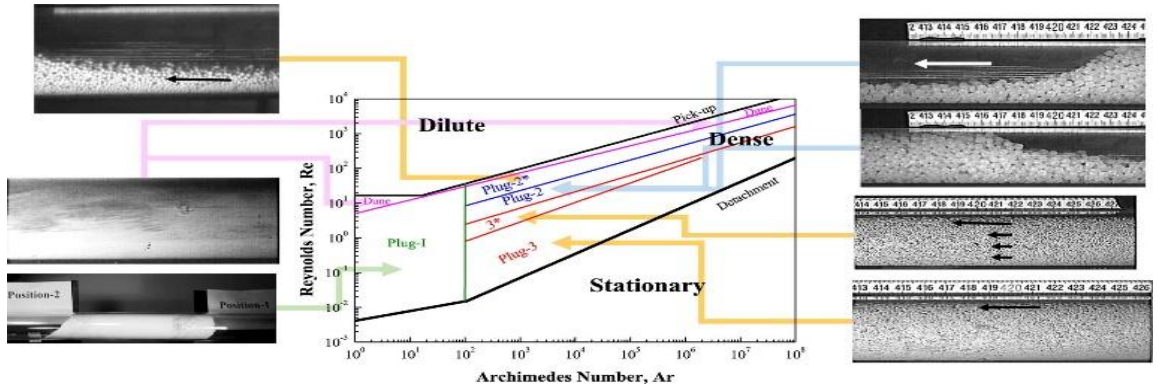
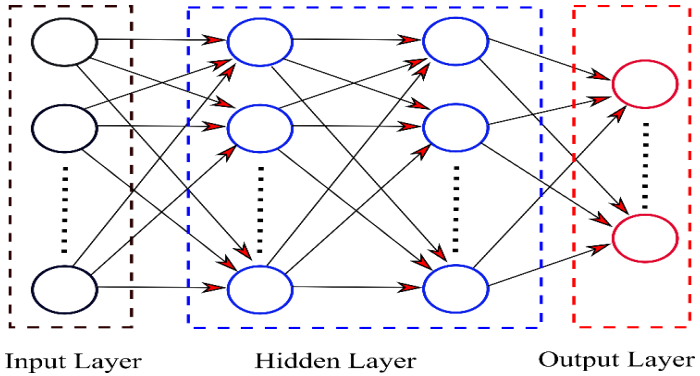
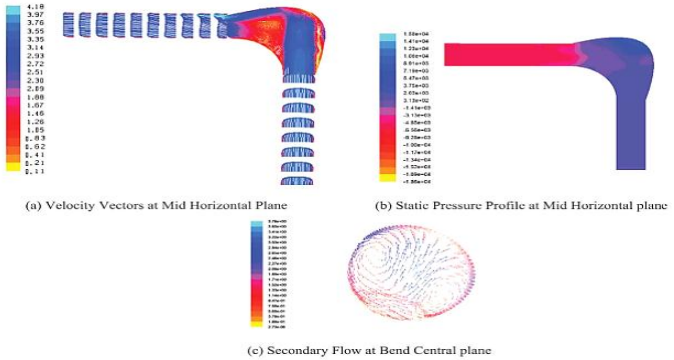
- Multiphase Flows
- Machine Learning
- Energy Efficiency



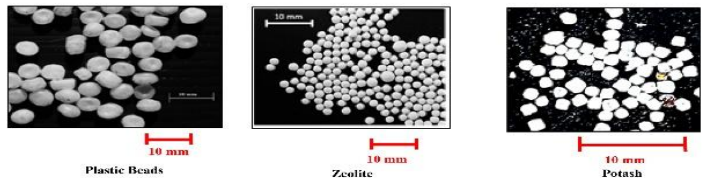
Plug Flow Pneumatic Conveying Phase Diagram



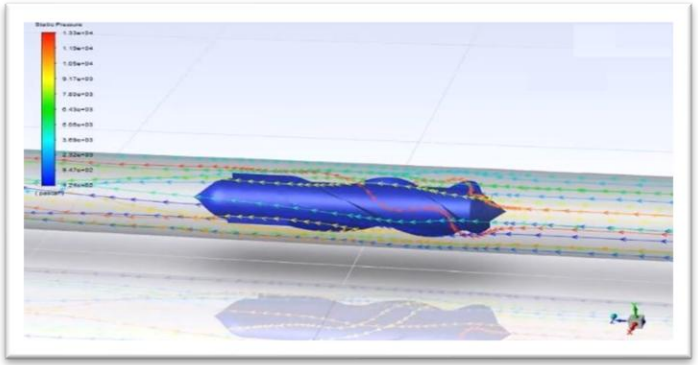
Machine Learning in Energy Performance



Ash Slurry flow through bends



Particulate Materials



Blood Pump

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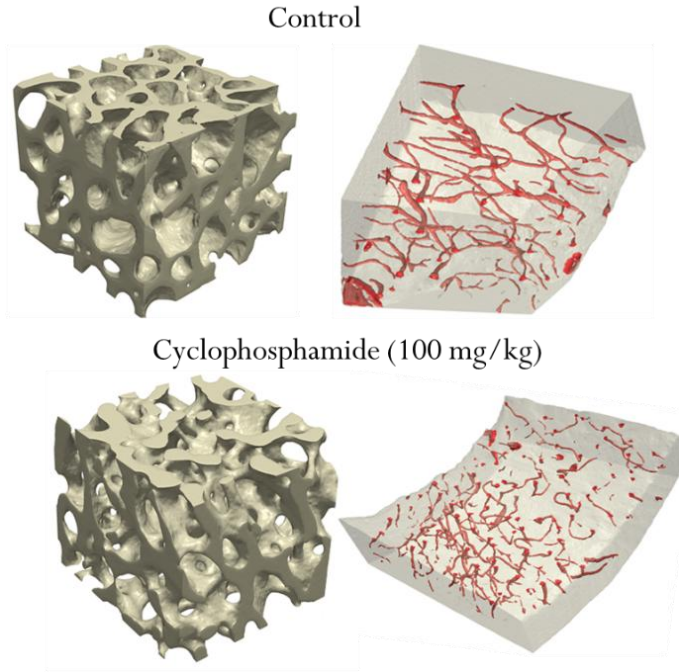
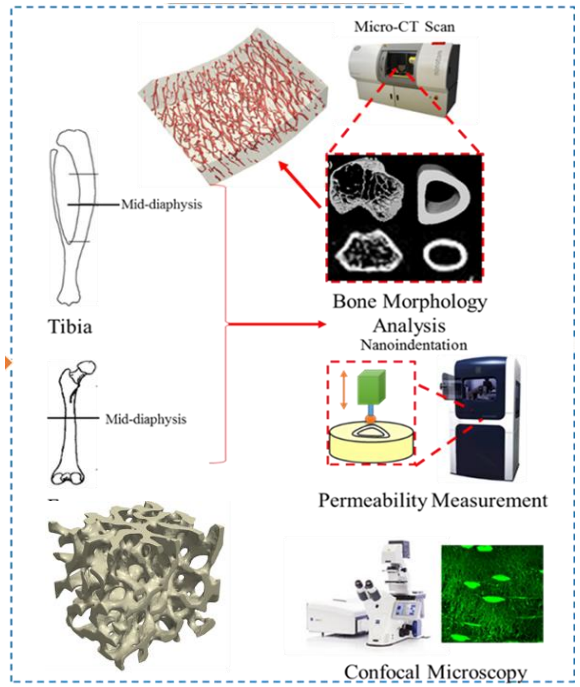
http://mnnit.ac.in/profile/previewp.php?id=1462

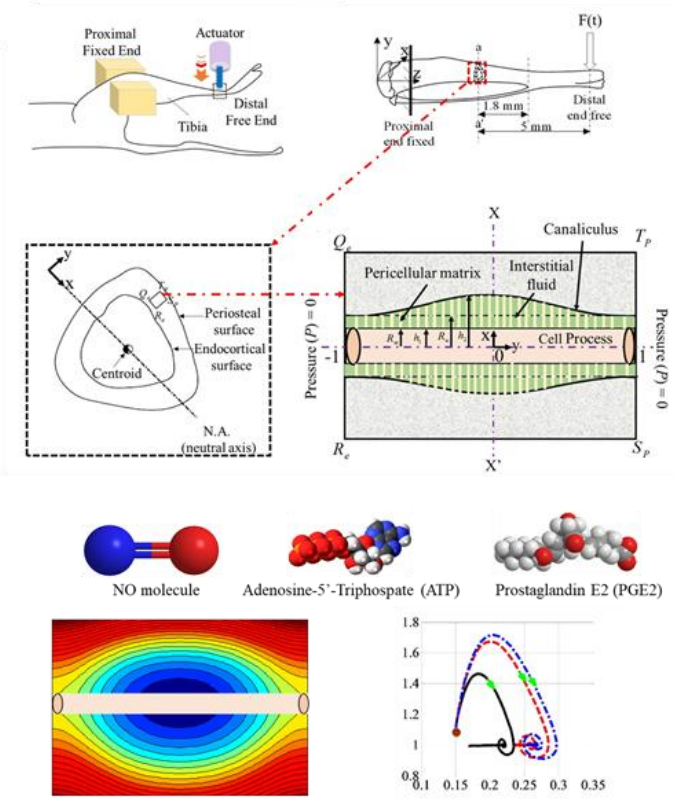
- Orthopaedic Biomechanics
- Skeletal Mechanobiology
- Biological Materials
- Mechanotransduction



Anti-Cancer Drug Influences Bone Health!



Women Health Improvement: Post-Menopausal Osteoporosis



Bone Fluid Driven Mechanotransduction

Dr. Abhishek Kundu

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Assistant Professor, Department of Applied Mechanics

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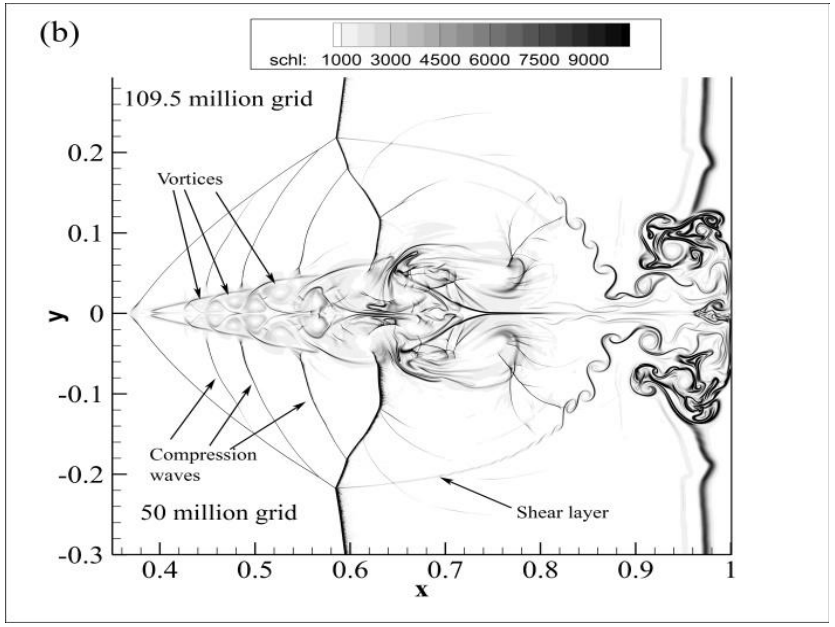
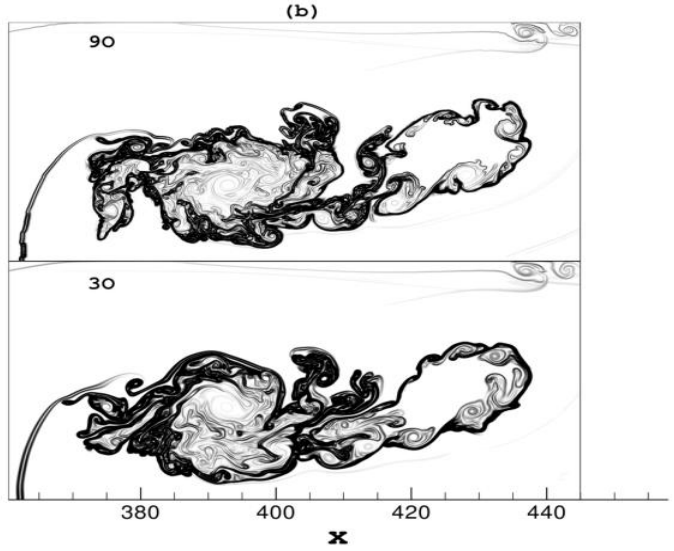
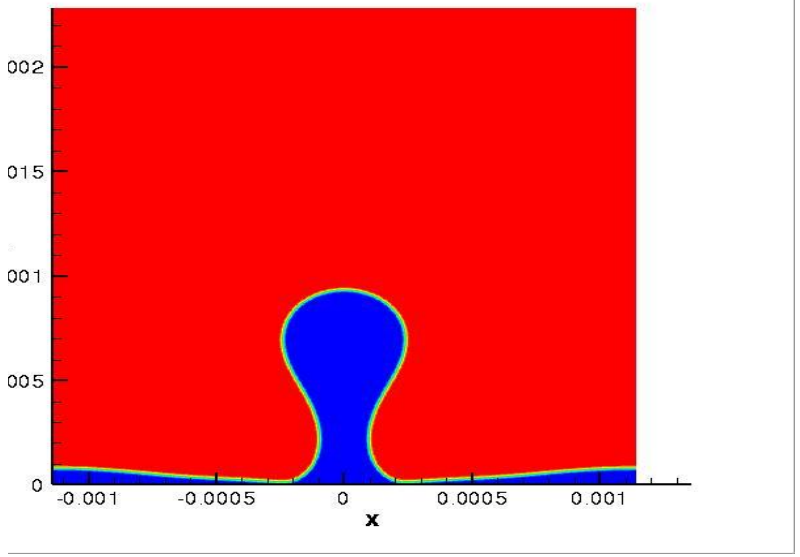
http://www.mnnit.ac.in

- **High Speed Flow / Compressible Computational Fluid Dynamics**
- **High Resolution Numerical Solver / Development of in-house accurate CFD Solver for Practical Problem**
- **Multiphase Flow / Study the bubble growth in Film Boiling**







Computational Fluid Dynamics, High Speed Flow, Compressible CFD, High Resolution Solver, Multiphase Flow, Heat Exchanger

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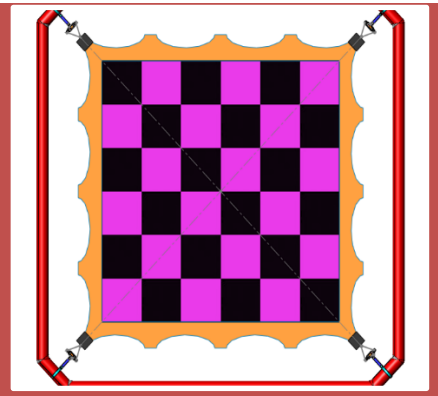
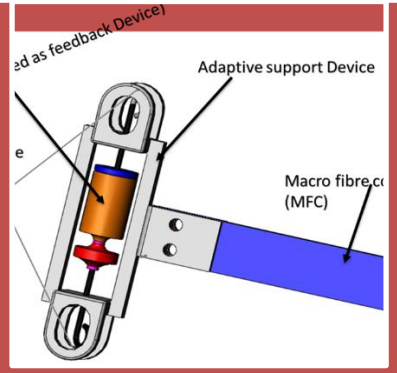
- **Shape Control Analysis**
- **Smart Materials and Structures**
- **Dynamics Analysis**



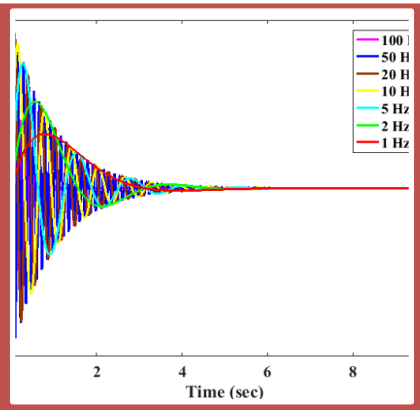
Space Application

(Membrane based Structures)



Hybrid Energy Harvesting

(Piezo based)



Active Vibration Control

(SMP and SMPC based)

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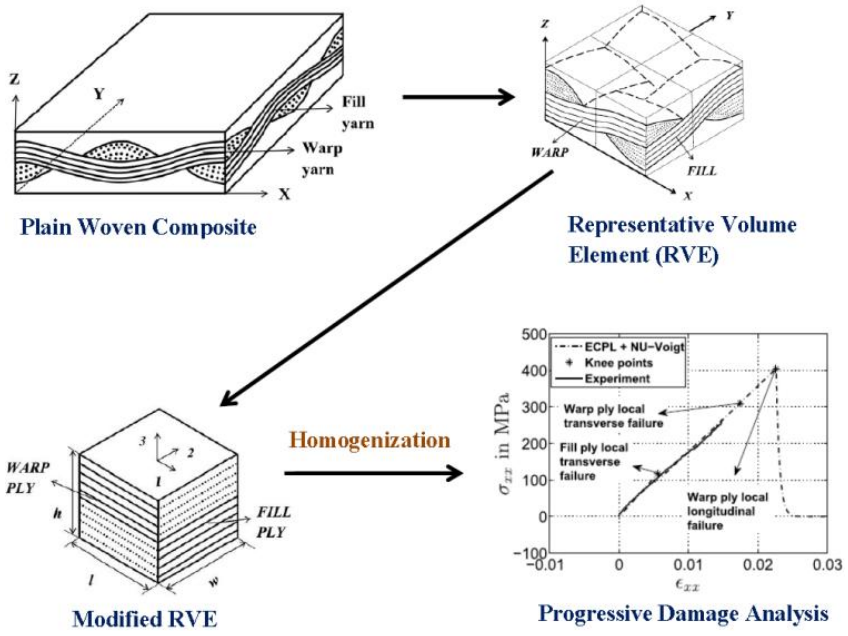
1.) Multi-scale progressive damage analysis

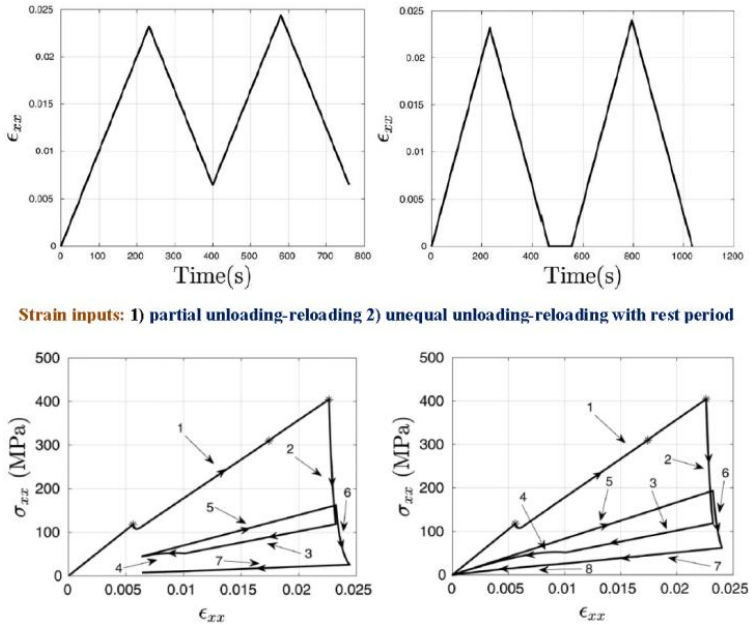
2.) Damage-healing mechanics

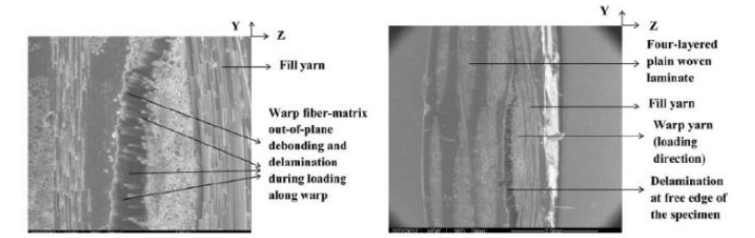
3.) Fracture behaviour studies

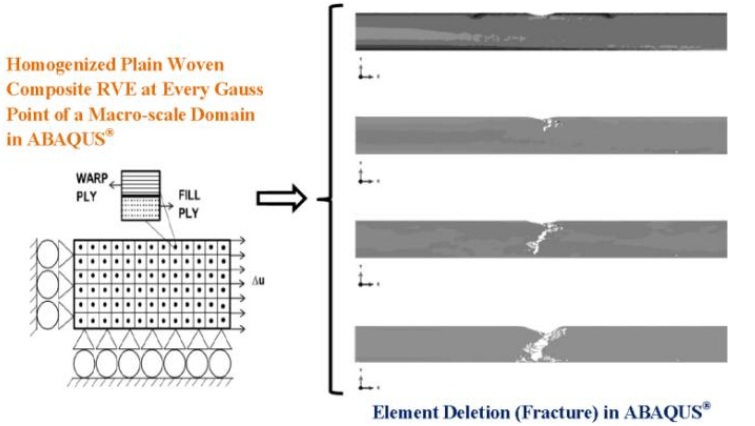


1

2







3

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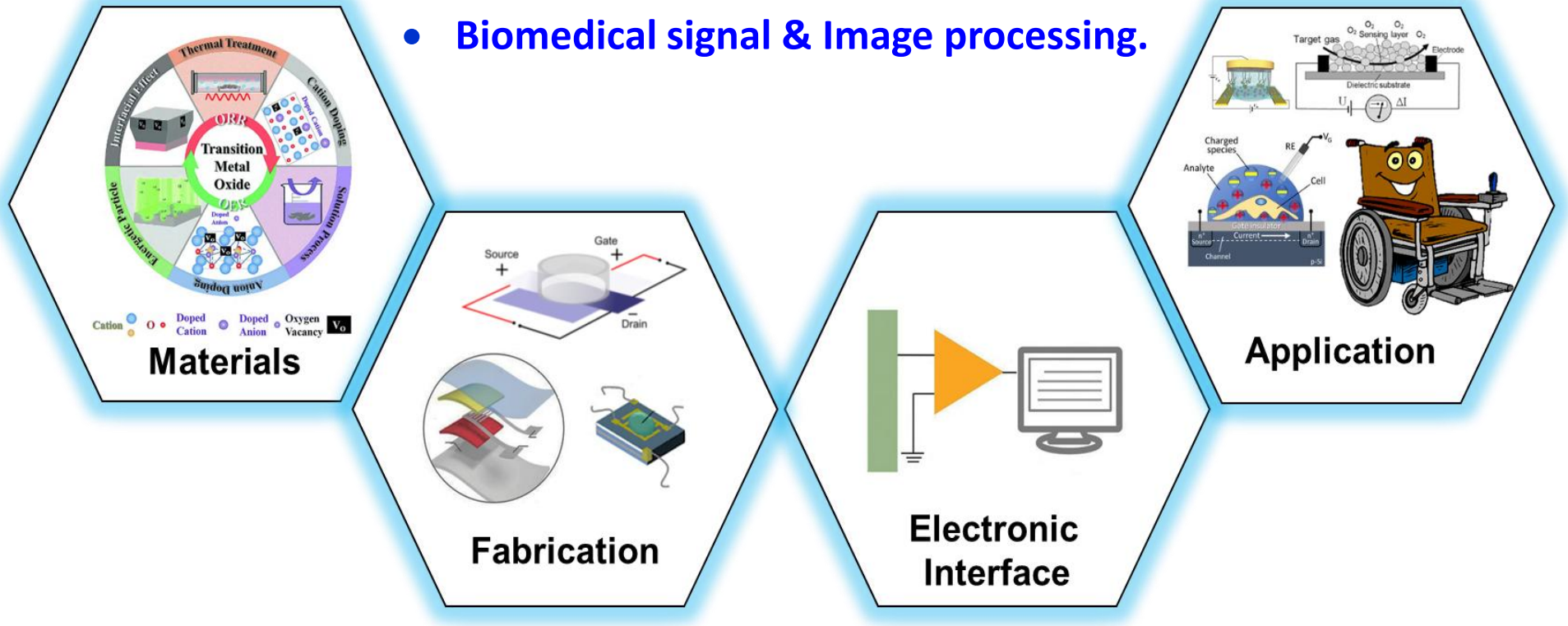
- **Bioinstrumentation design,**
- **Bioelectronic devices for POC applications,**
- **Cellular analysis using semiconductor devices,**
- **Biomedical signal & Image processing.**



Dr. Brij Kishor

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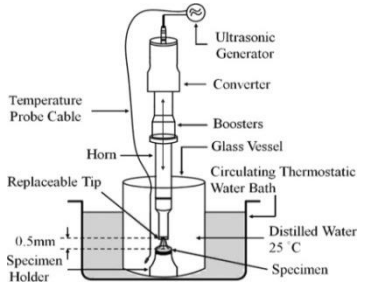
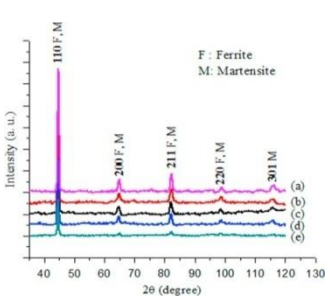
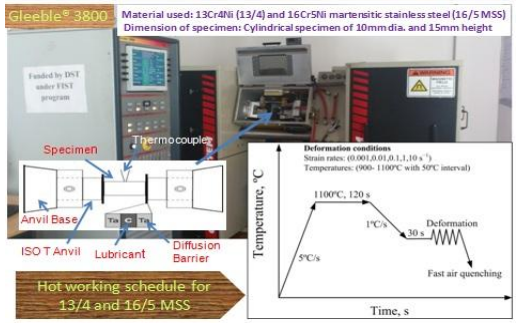
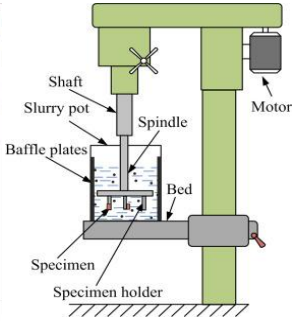
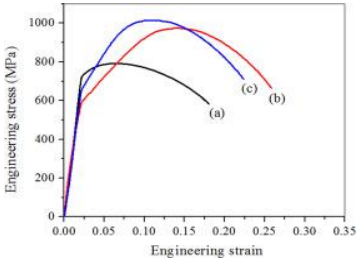
- Cavitation erosion behaviour of stainless steel
- Thermomechanical processing of stainless steel and physical simulation
- Slurry erosion behaviour of stainless steel

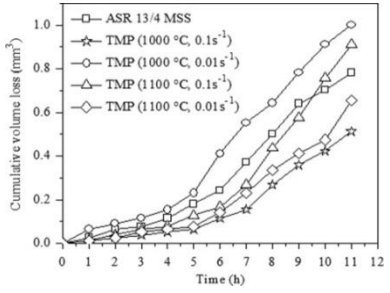


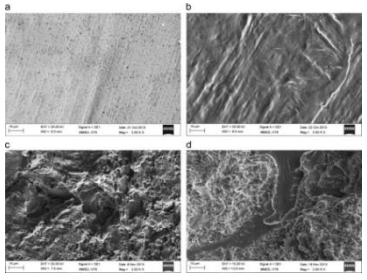


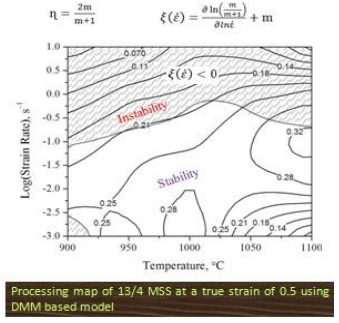


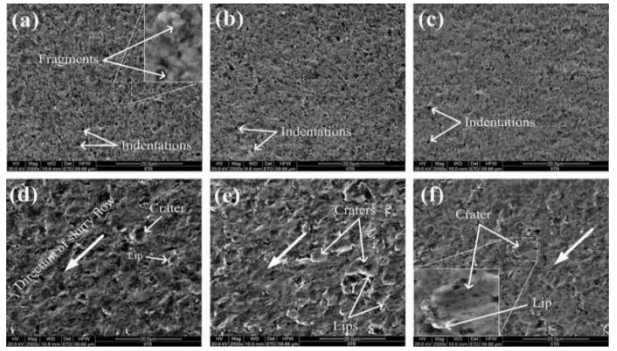












B Kishor et al., Wear, 319 (1–2), 2014, 150-159

B Kishor et al.,J. Mater. Eng. Perform, 25, 201 2651–2660

B Kishor et al., Tribology International 93, Part A, 2016, 50-57

Plastic deformation of materials, Heat treatment of materials, Erosion behaviour of materials, Solidification and casting of materials, Mechanical behaviour of materials, Physical simulation and material modelling

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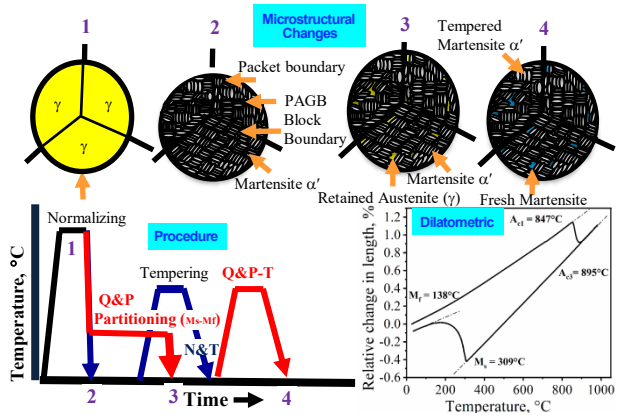
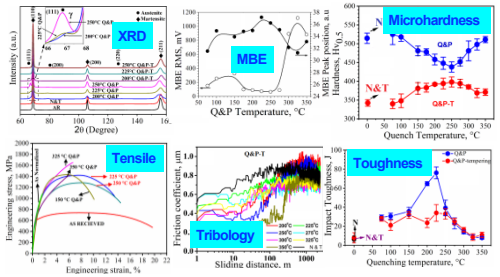
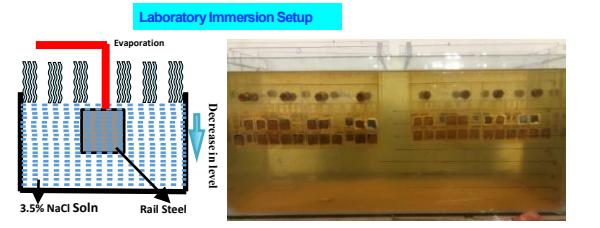
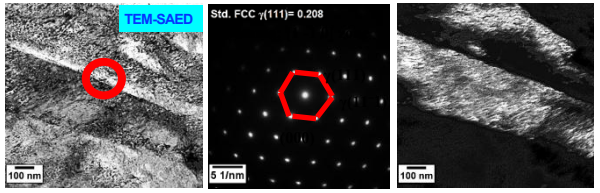
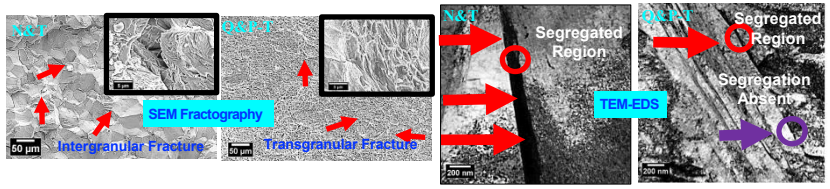
- Microstructure-Mechanical Properties Correlation of Steels
- Corrosion and Oxidation Behavioural Studies of Metals & its Alloy
- Wear and Tribological Studies
- High Temperature Materials

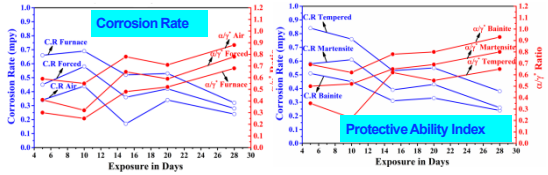












Quenching & Partitioning treatments to resolve temper embrittlement problem and to improve mechanical properties of 12 Cr martensitic steel

Effect of water parameters on corrosion behaviour of high-carbon pearlitic rail steel in 3.5% NaCl

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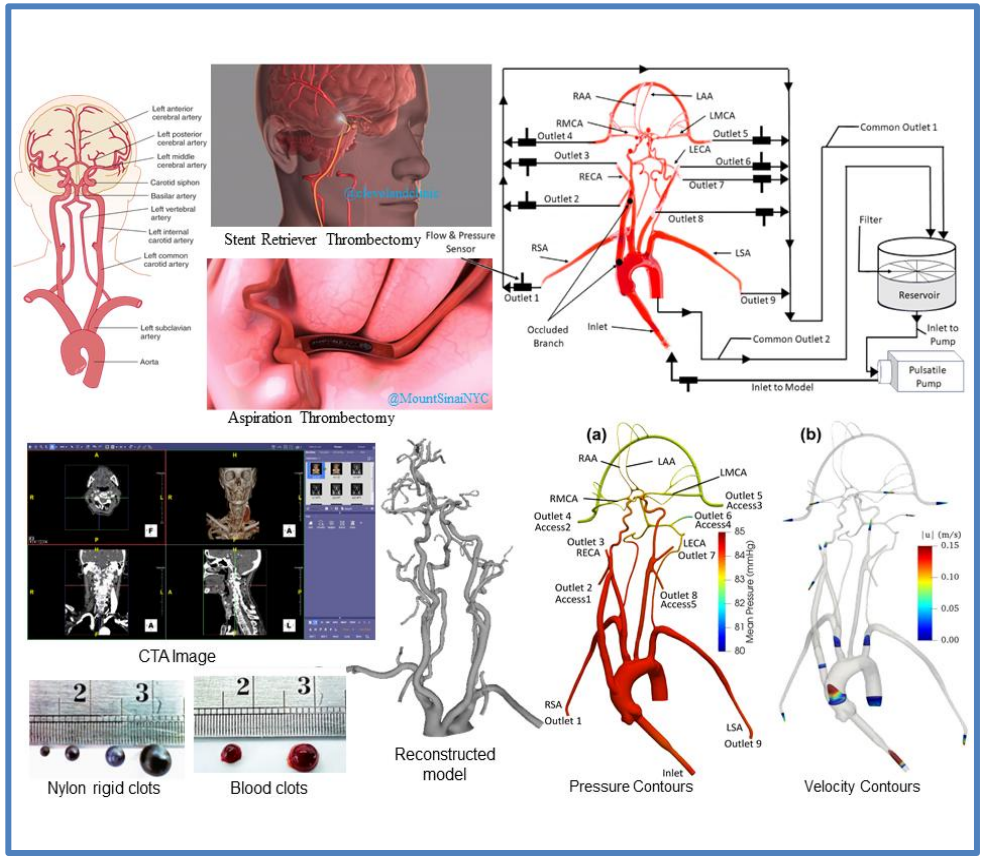
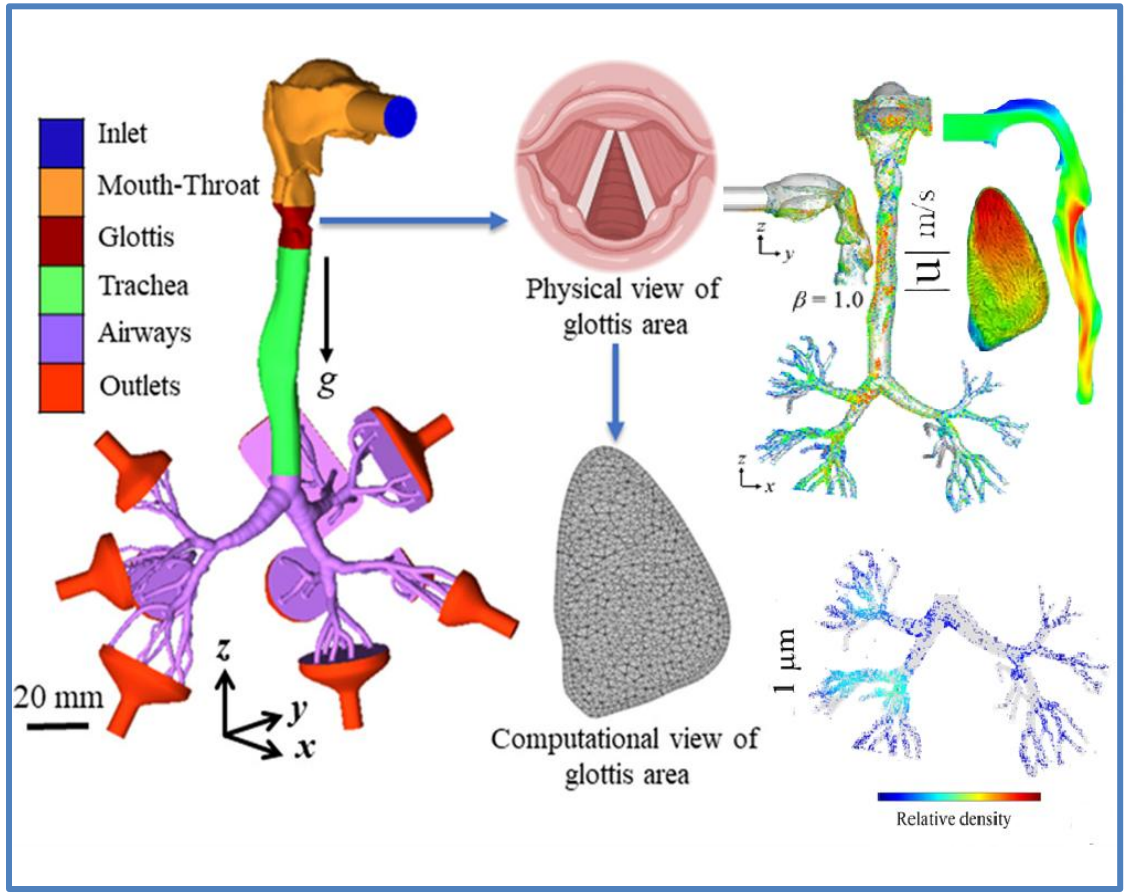


***In Vitro-In Silico* analysis of Acute Ischemic Strokes**



Influence of glottal motion on aerosols deposition in airways

Department of Biotechnology

Dr. Shivesh Sharma

Ph.D. [Dr. RML Avadh University, Faizabad, India]

Professor, Department of Biotechnology, MNNIT Allahabad

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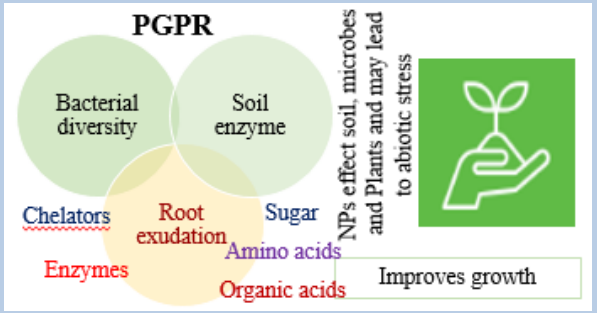
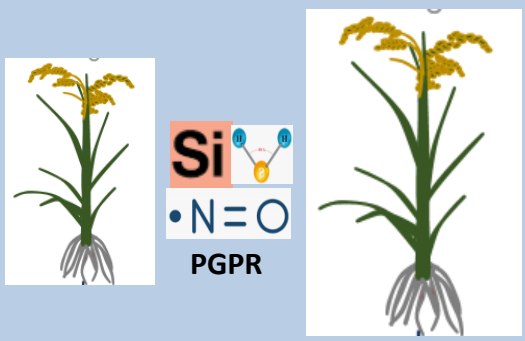
Plant Microbe Interaction

Environmental Biotechnology

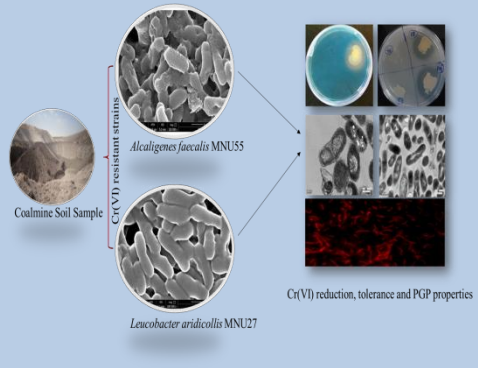
Plant Stress Physiology



Harnessing Plant Microbe Nanoparticle interaction for sustainable agriculture



Mitigating plant stress using various alleviator molecules



Microbes as tool for bioremediation and bioprospecting

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Biowaste to Bioenergy

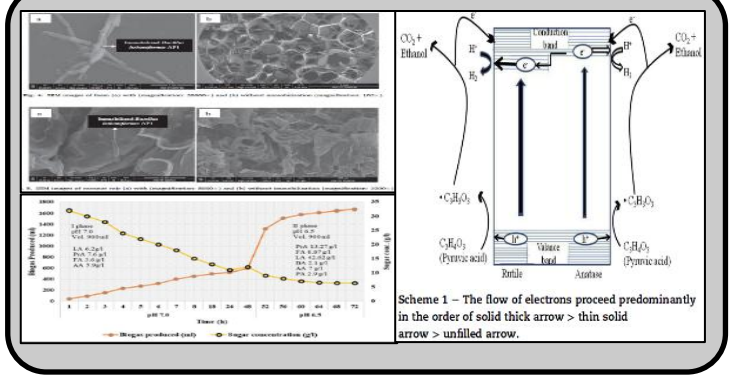
- Rai P et al., 2022. Evaluation of low cost immobilized support matrices in augmentation of biohydrogen potential in dark fermentation process using *B. licheniformis* AP1. Fuel, 310: 122275. [IF: 6.609]
- Pandey A et al., 2021. Hydrogen production by sequential dark and photo fermentation using wet biomass hydrolysate of *Spirulina platensis*: Response surface methodological approach. IJHE, 8;46(10):7137-46. [IF: 5.816]
- Swain P et al., 2020. Enhanced lipid production in Tetraselmis sp. by two stage process optimization using simulated dairy wastewater as feedstock. Biomass to Bioenergy, 139:105643. [IF: 5.061]
- Pandey A et al., 2019. Cheese whey to biohydrogen and useful organic acids: A non-pathogenic microbial treatment by *L. acidophilus.* Scientific Reports, 9(1):8320. [IF: 4.379]
- Gupta K et al., 2013. Photocatalytic antibacterial performance of TiO_2 and Ag-doped TiO_2 against *S. aureus, P. aeruginosa* and *E. coli.* Beilstein Journal of Nanotechnology, 4:345-351. [IF: 3.65]

Health Biotechnology & Nanobiotechnology

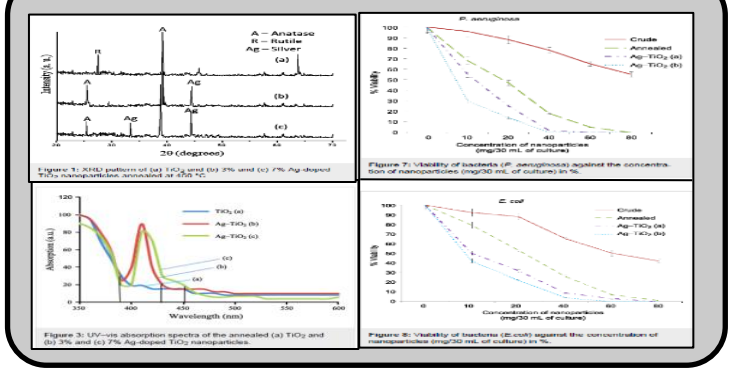
- Aggarwal V et al., 2022. Molecular mechanisms of action of epigallocatechin gallate in cancer: Recent trends and advancement. Seminars in Cancer Biology, 80:256-275. [IF: 15.707]
- Kashyap D et al., 2019. Natural product-based nanoformulations for cancer therapy: Opportunities and challenges. Seminars in Cancer Biology, 65:5-23. [IF: 15.707]
- Pandey A et al., 2019. A novel method of GNP synthesis and its application for heavy metals (Cr^{3+}, Cd^{2+} and Hg^{2+}) detection through electrochemical analyzer. [Patent published]
- Pandey A et al., 2016. Optical biosensor and a method of preparation and its application there of for detection of *Salmonella typhi.* [Patent published]
- Kesarwani, RC et al., 2004. Polymerase Chain Reaction (PCR): Its comparison with conventional techniques for diagnosis of extra pulmonary tubercular disease. Indian J. of Surgery, 66(2):84-89. [IF: 0.656]

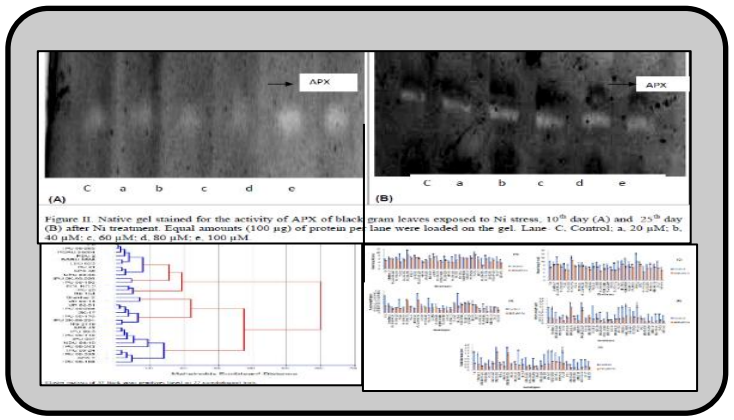
Plant Biotechnology

- Shamim MZ et al., 2018. Simultaneous selection model based evaluation of arsenic tolerance in black gram (*Vigna mungo* L.) using morphological parameters. Legume Research, 42:314-319. [IF: 0.63]
- Yadav N et al., 2018. Phytic acid and inorganic phosphate in black gram (*Vigna mungo*) species and their effect on human body. Indian Journal of applied research, 8 (11). [IF: 2.165]
- Shamim MZ et al., 2017. Effects of arsenic toxicity on morphological characters in blackgram (*Vigna mungo* L.) during early growth stage. CMB, 63:38-43. [IF: 4.272]
- Pandey A et al., 2012. Cyanobacterial hydrogen production-A step towards clean environment. IJHE, 37:139-150. [IF: 5.816]
- Dubey D et al., 2011. Effect of Nickel (Ni) on chlorophyll, lipid peroxidation and antioxidant enzymes activities in black gram (*Vigna mungo*) leaves. Int Journal of Science and Nature, 2:395-401. [IF: 0.545]



Scheme 1 – The flow of electrons proceed predominantly in the order of solid thick arrow > thin solid arrow > unfilled arrow.





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Associate Professor, Department of Biotechnology

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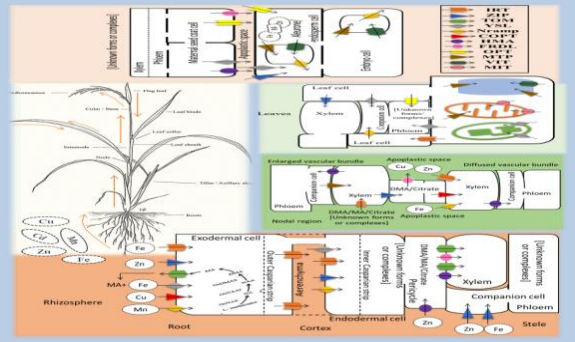
Research /Focus area:

- Agricultural biotechnology : Biofortification.
- Functional and applied genomics: Novel Gene mapping.
- Abiotic stress in plant: Temperature and drought tolerance.
- Bio prospecting of herbal extract and microalgae:Health care & value-added products.

Application 1

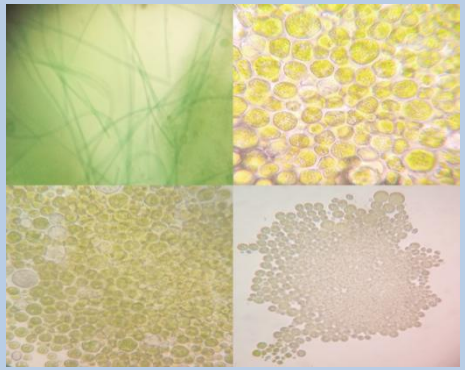
- ✓ Genome mapping & identification of genes.
- ✓ Bio fortification of Fe and Zn in crop plant.
- ✓ Nutritional quality improvement in crop plant.

Application 2



- ✓ Development climate resilient crop plant.
- ✓ Study the gene families contributing in yield and micronutrient uptake in plants.
- ✓ Nanoparticles mediated biotic and abiotic management.

Application 3



- ✓ Nutraceutical applications of microalgae.
- ✓ Use of herbal extract for health care applications..
- ✓ Plant Tissue culture.

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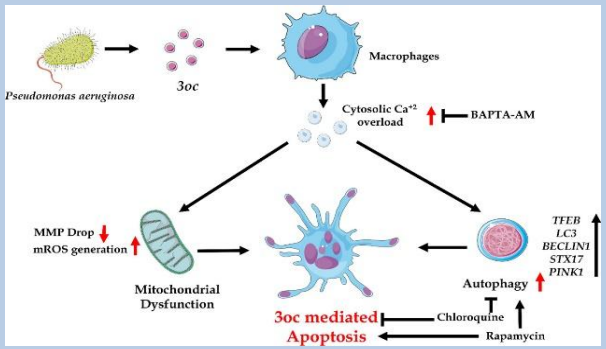
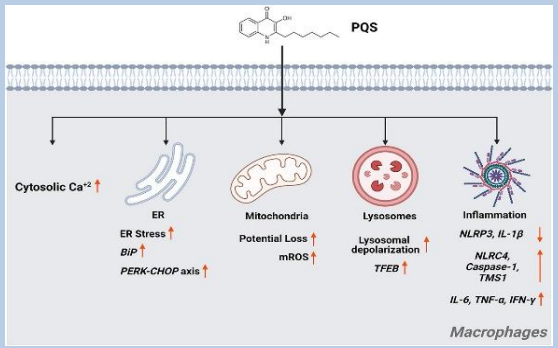
Research Area:

- Biofilms, Quorum Sensing, Infections and Therapy
- Study of cell death and response in presence pathogens and molecules
- Immuno-modulatory activity of herbal formulations and Drugs



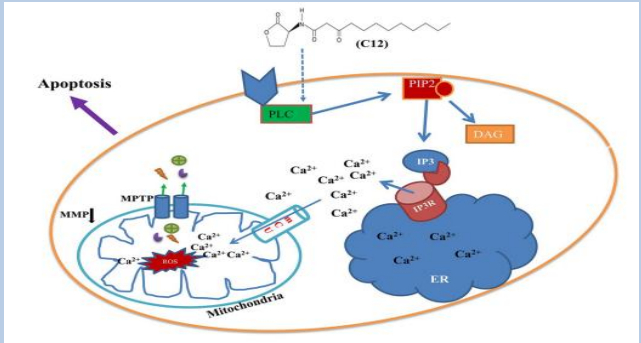
N-(3-oxododecanoyl) homoserine lactone induces calcium signaling-dependent crosstalk between autophagy and apoptosis in human macrophages

Ankit Kushwaha , Rama Shanker Verma , Vishnu Agarwal, 2022, *Pseudomonas aeruginosa* quorum-sensing molecule N-(3-oxododecanoyl) homoserine lactone induces calcium signaling-dependent crosstalk between autophagy and apoptosis in human macrophages. Cellular Signaling 99 (2022)110441



Pseudomonas quinolone signal induces organelle stress

Ankit Kushwaha , Vivek Kumar, Vishnu Agarwal , Pseudomonas quinolone signal induces organelle stress and dysregulates inflammation in human macrophages. BBA-General Subjects 1867 (2023) 130269



Proposed mechanism for C12-induced, calcium-mediated mitochondrial dysfunction

Pradeep Kumar Singh, Vivek Kumar Yadav, Manmohit Kalia, Deepmala Sharma, Deepak Pandey, Vishnu Agarwal. *Pseudomonas aeruginosa* quorum-sensing molecule N-(3-Oxododecanoyl)-L-homoserine lactone triggers mitochondrial dysfunction and apoptosis in neutrophils through calcium signaling. (2019). Medical Microbiology and Immunology

Dr. Manisha Sachan

Ph.D, Banaras Hindu University

Associate Professor, Department of Biotechnology

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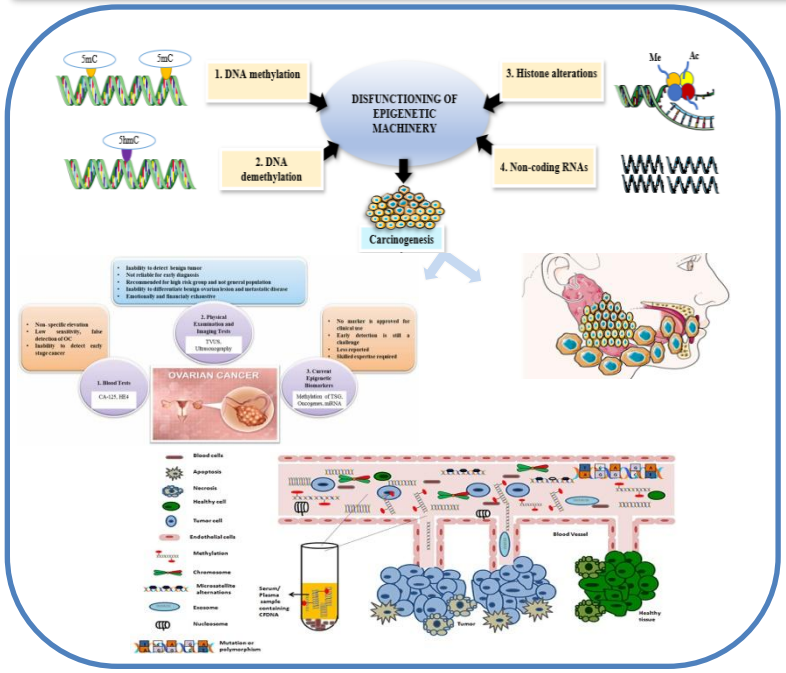
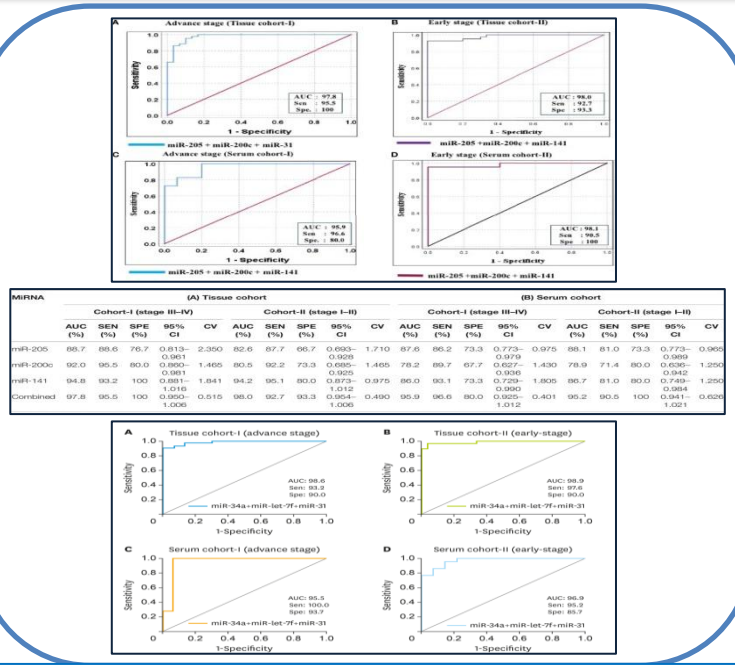
Research Area

- **Epigenetics of ovarian and oral cancer**
- **Screening epigenetic biomarkers for early detection of cancer (Ovarian and Oral)**
- **Liquid biopsy-based biomarker Identification**

Conrad Waddington *coined the term "**epigenetics**" to describe heritable phenotype resulting from changes in a chromosome without alterations in the DNA sequence.*

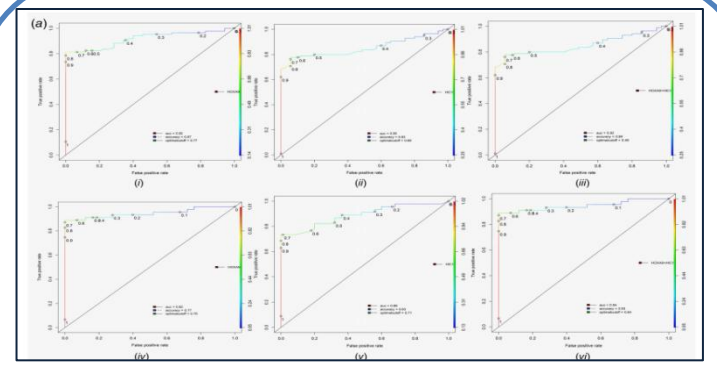


Overview of epigenetic machinery dysregulated in ovarian and oral carcinogenesis. **(Biomed Pharmacother. 2022; Front Cell Dev Biol. 2019)**



MiRNA	(A) Tissue cohort										(B) Serum cohort									
	Cohort-I (stage III–IV)					Cohort-II (stage I–II)					Cohort-I (stage III–IV)					Cohort-II (stage I–II)				
	AUC (%)	SEN (%)	SPE (%)	95% CI	CV	AUC (%)	SEN (%)	SPE (%)	95% CI	CV	AUC (%)	SEN (%)	SPE (%)	95% CI	CV	AUC (%)	SEN (%)	SPE (%)	95% CI	CV
miR-205	88.7	88.6	76.7	0.813–0.961	2.350	82.6	87.7	66.7	0.693–0.928	1.710	87.6	86.2	73.3	0.773–0.979	0.975	88.1	81.0	73.3	0.773–0.989	0.965
miR-200c	92.0	95.5	80.0	0.850–0.981	1.465	80.5	92.2	73.3	0.695–0.925	1.465	78.2	89.7	67.7	0.627–0.936	1.430	78.9	71.4	80.0	0.636–0.942	1.250
miR-141	94.8	93.2	100	0.881–1.016	1.841	94.2	95.1	80.0	0.873–1.012	0.975	86.0	93.1	73.3	0.729–0.990	1.805	86.7	81.0	80.0	0.749–0.984	1.250
Combined	97.8	95.5	100	0.950–1.006	0.515	98.0	92.7	93.3	0.954–1.006	0.490	95.9	96.6	80.0	0.925–1.012	0.401	95.2	90.5	100	0.941–1.021	0.626

ROC curve analysis in tissue and serum cohort to evaluate the ability of the combined miRNA panel (miR-205 + miR-200c + miR-141) and (miR-34a+let-7f+miR-3) to be used as a diagnostic biomarker in ovarian cancer **(J Gynecol Oncol. 2022; Front Oncol. 2021)**



Singleplex MethyLight assay			Multiplex MethyLight assay
TISSUE	HOXA9 methylation status	HIC1 methylation status	Combination of both genes (at least one gene is methylated)
Sensitivity	82.3%	80.0%	88.2%
Specificity	85.7%	77.1%	88.6%
AUC (Area under the curve)	0.92	0.85	0.92
Optimal Cutoff	0.77	0.68	0.49
PPV	99.3%	89.5%	94.9%
NPV	66.7%	61.4%	75.6%
Accuracy	86.6%	82.5%	88.3%
p-value	<0.00001***	<0.00001***	<0.00001***
Methylation Index (MI)	0.82	0.80	0.88
SERUM			
Sensitivity	62.2%	71.1%	88.9%
Specificity	100.0 %	100.0%	100.0%
AUC (Area under the curve)	0.81	0.88	0.95
Optimal Cutoff	0.70	0.71	0.64
PPV	100.0%	100.0%	100.0%
NPV	59.5%	65.7%	83.3%
Accuracy	77.1%	82.8%	92.8%
p-value	<0.00001***	<0.00001***	<0.00001***
Methylation Index (MI)	0.62	0.71	0.88

ROC curve analysis for the biomarkers HOXA9, HIC1, and the combined panel; its diagnostic significance and methylation index in singleplex and multiplex MethyLight assays **(Int J Cancer. 2020).**

Dr. Seema Nara

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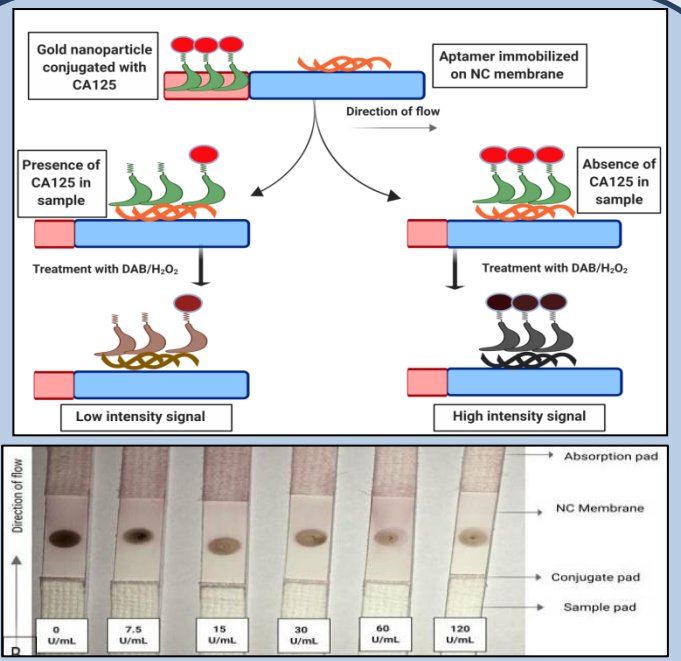
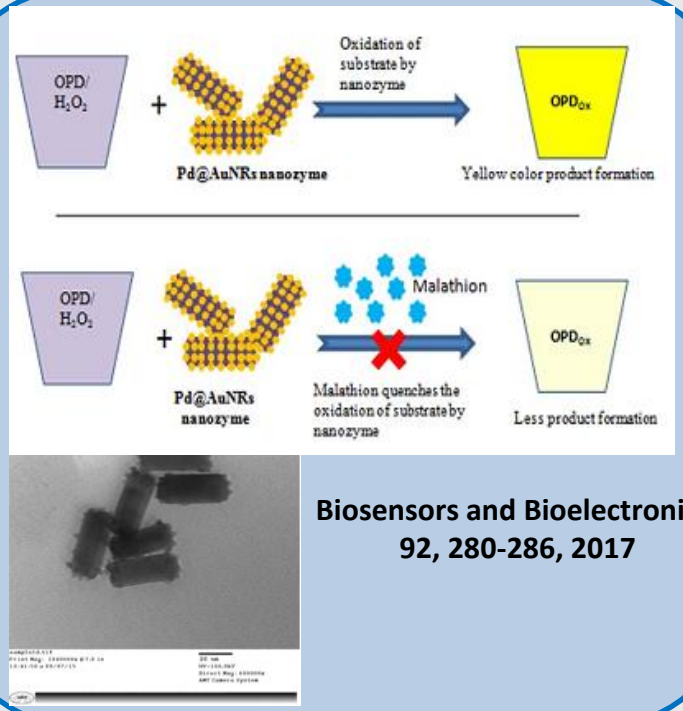
1. Point of Care Diagnostics and Biosensing
2. Nanotechnology in Diagnostics
3. Nanomaterials for Anti-tumor/Antibacterial Applications



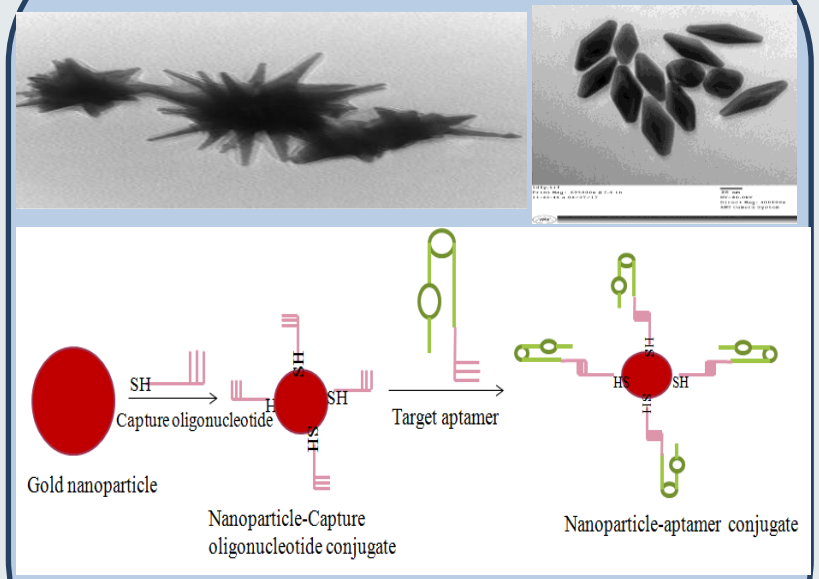
Biosensors and Bioelectronics, 165, 112368, 2020

1



Biosensors and Bioelectronics, 92, 280-286, 2017

2



Journal of Nanoparticle Research, 22, 116, 2020

3

Dr. Ambak Kumar Rai

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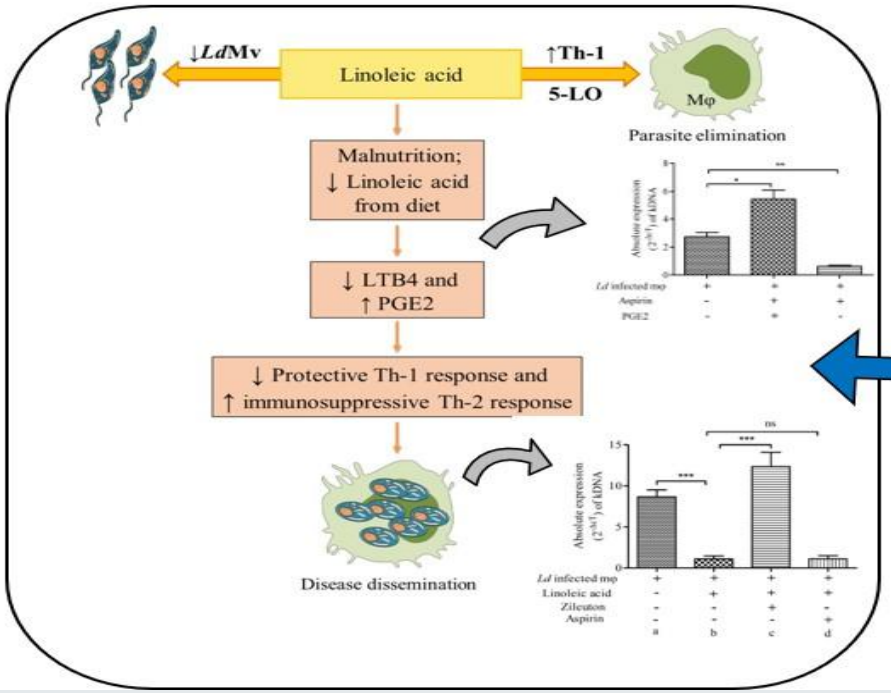
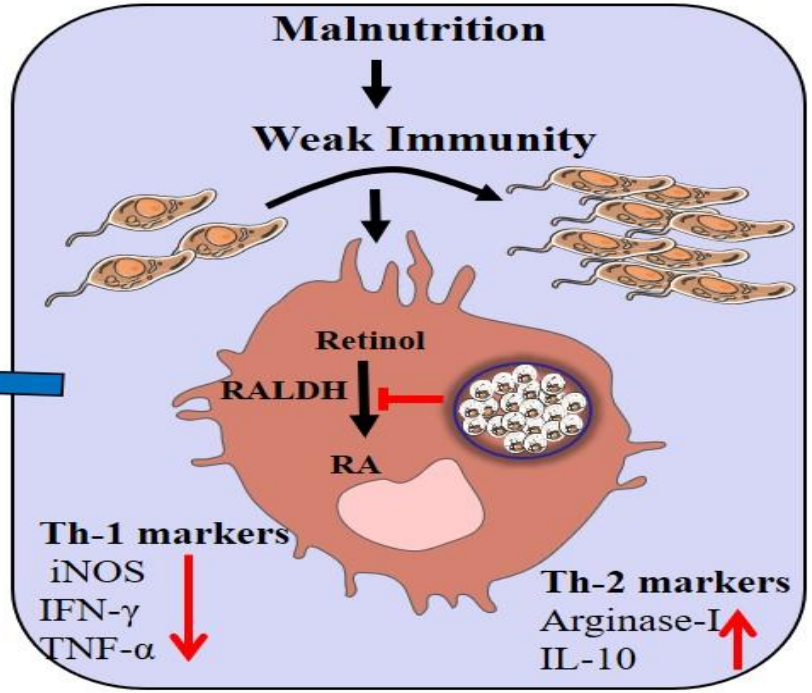
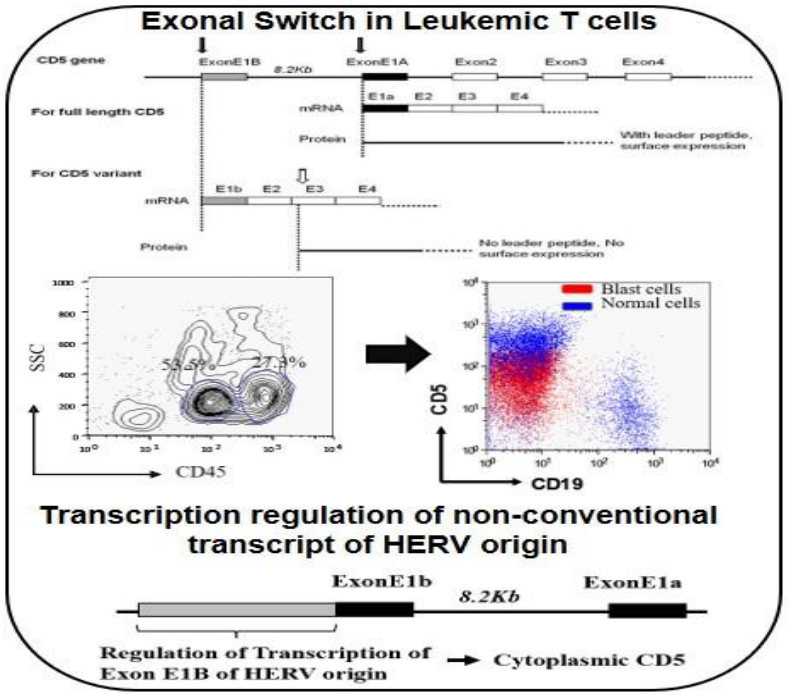
- **Immunology of Intracellular Infection:** Retinoic acid and Linoleic acid mediated restoration of immune response in *L. donovani* infection
- **Human Endogenous Retrovirus (HERV) mediated Immune Regulation:** Regulation of *exonal switch* in *cd5* of human T cells resulting in loss of CD5 expression on surface







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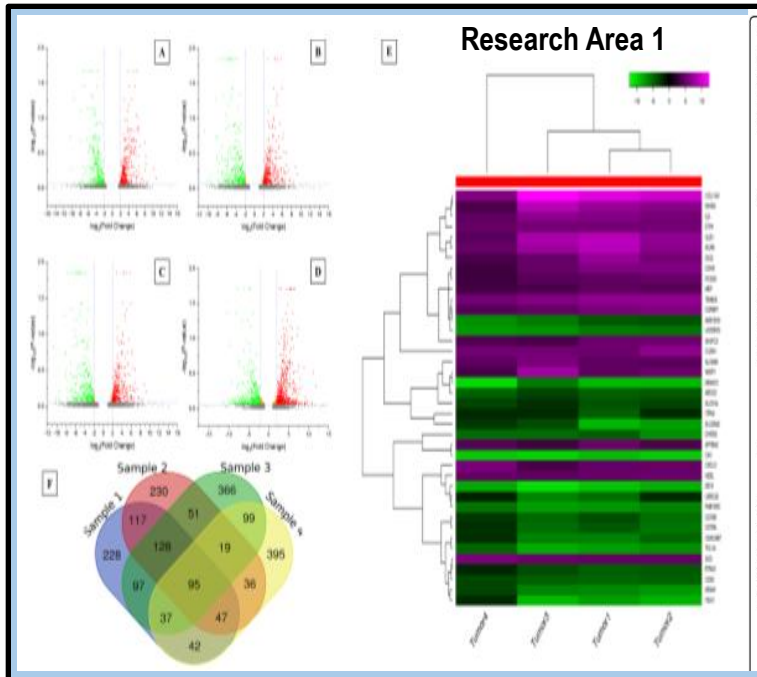
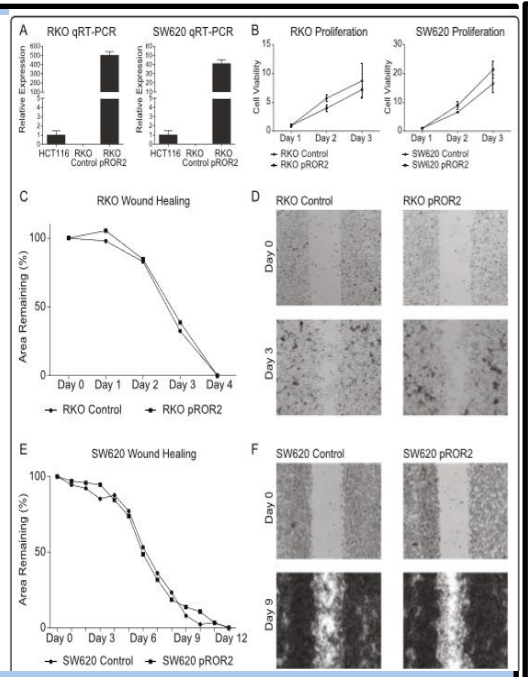
Research Area1: Epigenetic gene regulation in Colorectal Cancer, CRC Biomarkers, Fusion genes in CRC & their functional analysis

Research Area 2: Optimization of lipid production in microalgae, microbial synthesis of Isoprene, Monolignols

Research Area 1





Identification of CRC biomarkers: TNS1 & MET identified as biomarkers in EOCRC

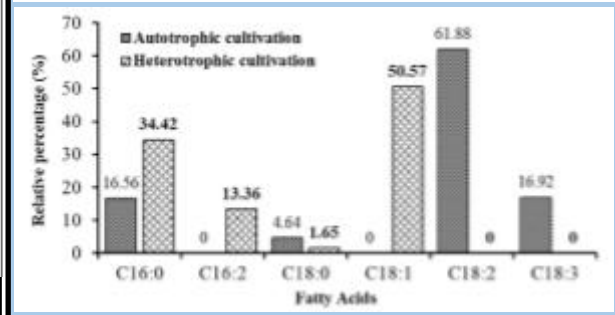
Functional Analysis of ROR2 gene in CRC

Singh et al. (2021) Scientific Reports,11:11765; Ma et al. BMC Cancer (2016) 16:508; A

Research Area 2

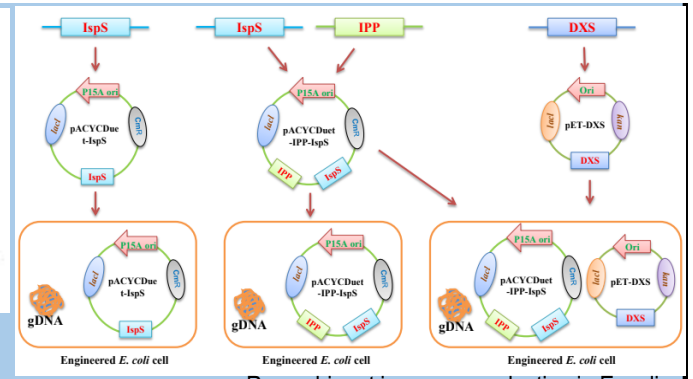
Table 5
Comparison with other investigators.

Microalgae strain	Cell density (g L^{-1})	Lipid content (% wt.)	Starch/carbohydrate content (% wt.)	Biomass productivity ($mgL^{-1}d^{-1}$)	Lipid productivity ($mgL^{-1}d^{-1}$)	Starch productivity ($mgL^{-1}d^{-1}$)	References
C. pyrenoidosa NCIM 2738	1.30	28.90	–	105.90	30.60	–	[17]
Chlorella sp.	4.48	25.10	–	–	112.40	–	[44]
Chlorella saccharophila UTEX 247	1.10	37.00	–	–	58.50	–	[45]
Chlorella sp. AE 10	–	–	60.50/77.60	–	–	311.00/421.00	[48]
Scenedemsus quadricauda	3.39	22.10	–	–	107.10	–	[37]
Scenedesmus sp. R-16	3.46	43.40	–	–	250.27	–	[35]
Microalgae consortium	6.12	23.4	–	408.00	95.47	–	[46]
Chlorella zofingiensis	–	–	–	699.00	–	268.00	[47]
Scenedesmus sp. ASK22	**4.67**	**28.46**	**32.83/-**	**667.14**	**189.87**	**219.02**	**Present study**



Lipid and Starch production optimization in microalgae

Pandey et al. Renewable Energy 150 (2020) 476e486



Recombinant isoprene production in E. coli

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- **Bioinformatics**
- **Computer aided drug designing**
- **Alzheimer's disease**

Genomics 112 (2020) 5122–5128

Contents lists available at ScienceDirect

Genomics

journal homepage: www.elsevier.com/locate/ygeno

Original Article

Machine learning method using position-specific mutation based classification outperforms one hot coding for disease severity prediction in haemophilia 'A'

Vikalp Kumar Singh[a], Neha Shree Maurya[b], Ashutosh Mani[b,*], Rama Shankar Yadav[a]

[a] Department of Computer Science and Engineering, Motilal Nehru National Institute of Technology Allahabad, UP 211004, India
[b] Department of Biotechnology, Motilal Nehru National Institute of Technology Allahabad, UP 211004, India

JOURNAL OF BIOMOLECULAR STRUCTURE AND DYNAMICS
https://doi.org/10.1080/07391102.2020.1817784

Taylor & Francis
Taylor & Francis Group

Screening natural inhibitors against upregulated G-protein coupled receptors as potential therapeutics of Alzheimer's disease

Amit Chaudhary[a], Vishal Singh[b], Pritish Kumar Varadwaj[b] and Ashutosh Mani[a]

scientific reports

OPEN

Transcriptome profiling by combined machine learning and statistical R analysis identifies TMEM236 as a potential novel diagnostic biomarker for colorectal cancer

Neha Shree Maurya[1], Sandeep Kushwaha[2], Aakash Chawade[3]✉ & Ashutosh Mani[1]✉

Contents lists available at ScienceDirect

Acta Tropica

journal homepage: www.elsevier.com/locate/actatropica

Comparative genomic analysis of *Rickettsia rickettsii* for identification of drug and vaccine targets: tolC as a proposed candidate for case study

Pramod Kumar Maurya[a], Swati Singh[b], Ashutosh Mani[a,*]

[a] Department of Biotechnology, Motilal Nehru National Institute of Technology Allahabad, 211004, India
[b] Center of Bioinformatics, University of Allahabad, 211002, India

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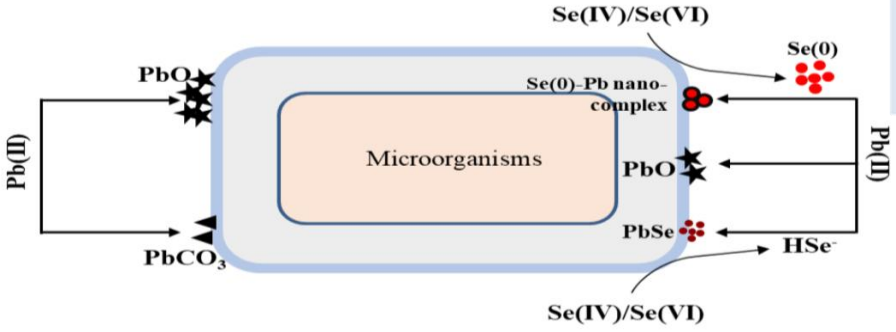
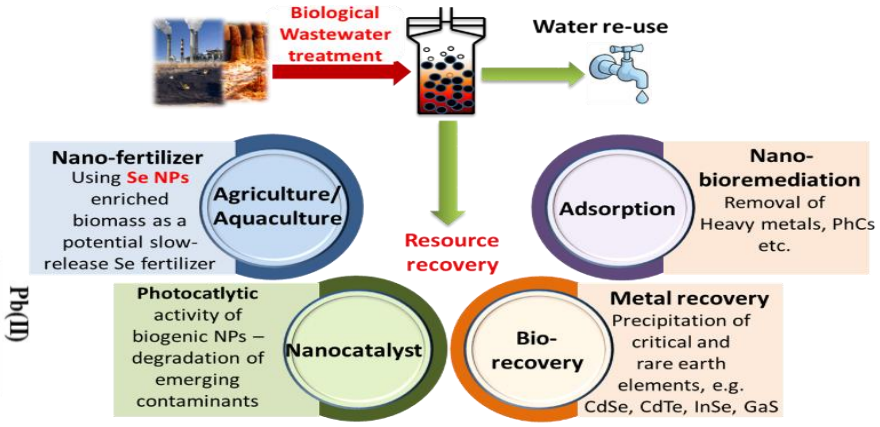
- **Environmental Biotechnology**
- **Biological wastewater treatment**
- **Environmental nanotechnology**



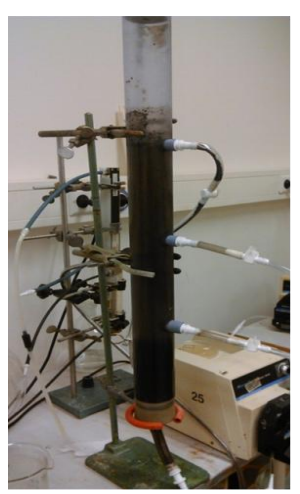
Removal of lead and selenium through biomineralization as lead selenide

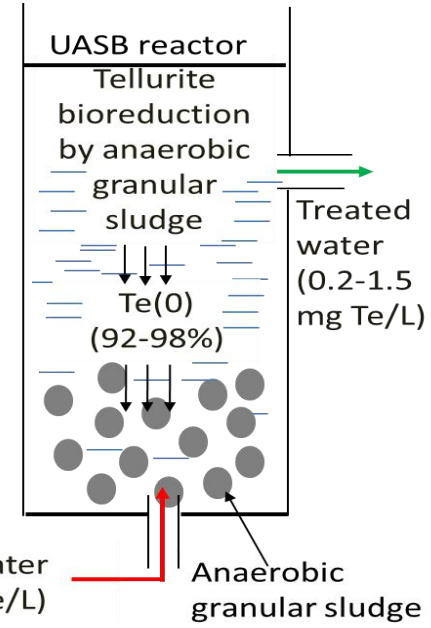
Mal, J. et al., J. Hazard. Mater. 2021, 420, 126663



Removal of selenium and ammonium by activated sludge in SBR reactor

Mal, J. et al., Bioresour. Technol. 2017, 229, 11





Continuous removal and recovery of tellurium in an UASB reactor

Mal, J. et al., J. Hazard. Mater. 2017, 327, 79

Biological wastewater treatment and sustainable development- 3Rs: Reduce, Reuse and Recycle

Dr. Rupika Sinha

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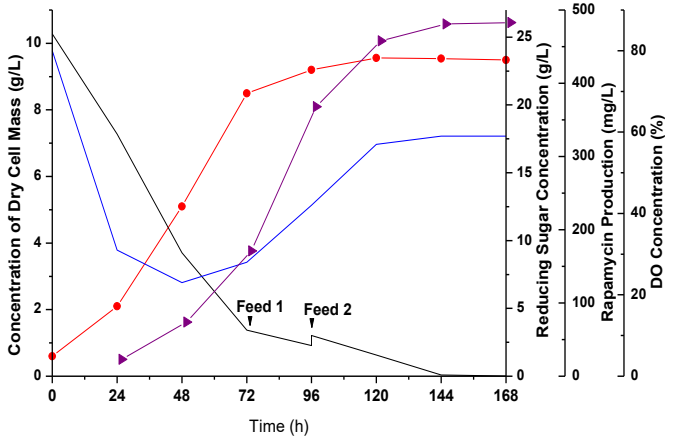
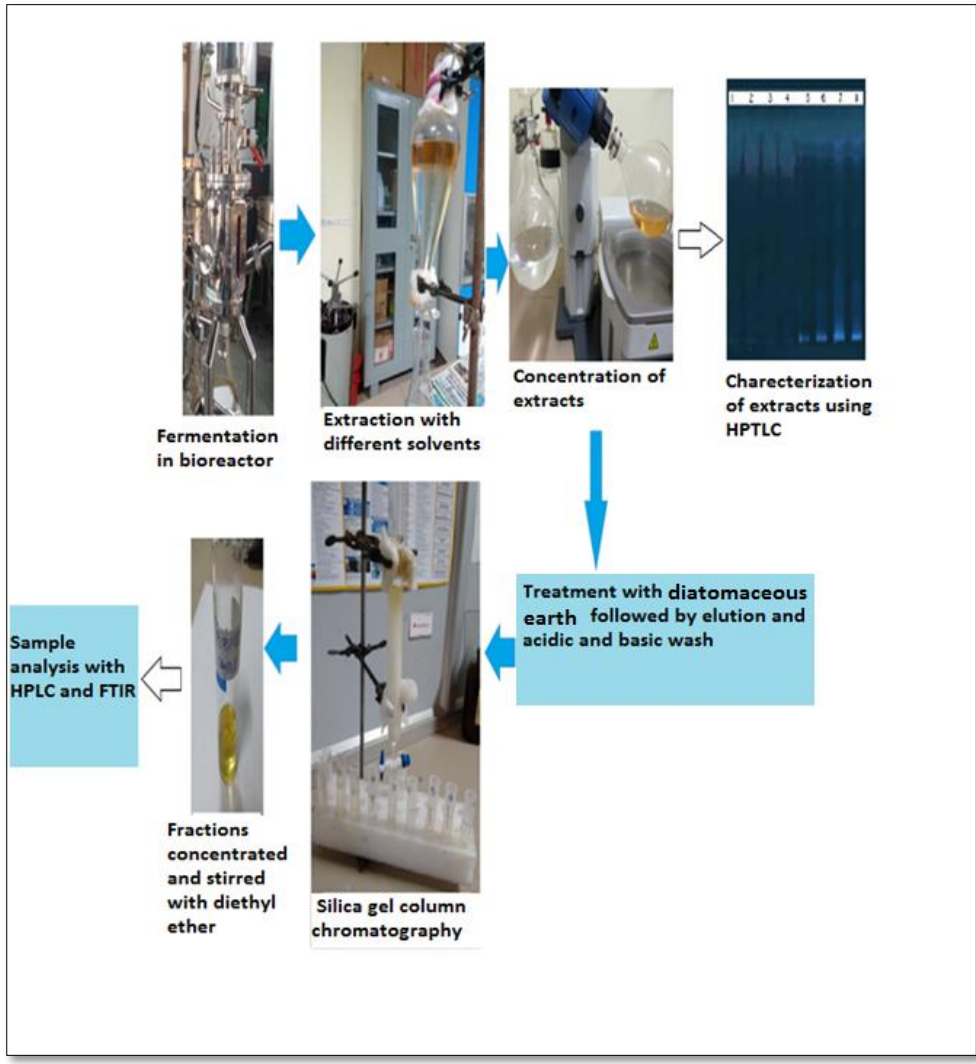
Assistant Professor, Department of Biotechnology

rupika@mnnit.ac.in , http://www.mnnit.ac.in

- **Bioprocess Technology**
- **Bioreactor Studies**
- **Design of Fermentation Strategies**





Department of Chemical Engineering

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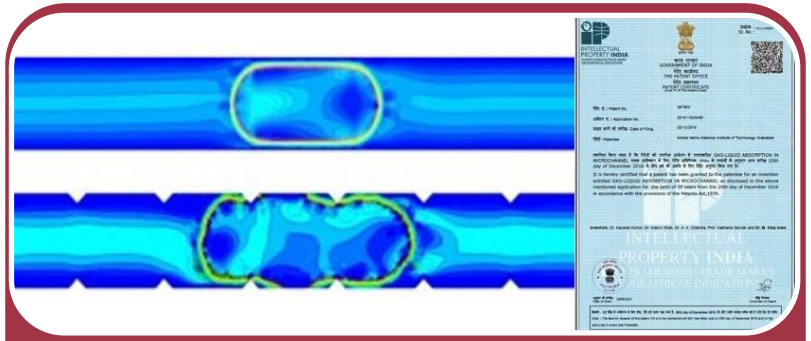
Research Area/Focus 1:	Modelling and Simulation of Microfluidic Devices
Research Area/Focus 2:	Chemical Reactor Analysis and Design: Micro-Structured Reactor (MSR), Catalytic Application of hybrid materials for wastewater treatment
Research Area/Focus 3:	Convective Heat Transfer: Design of Micro- and Macro- heat exchange devices with and without of Nanofluids.

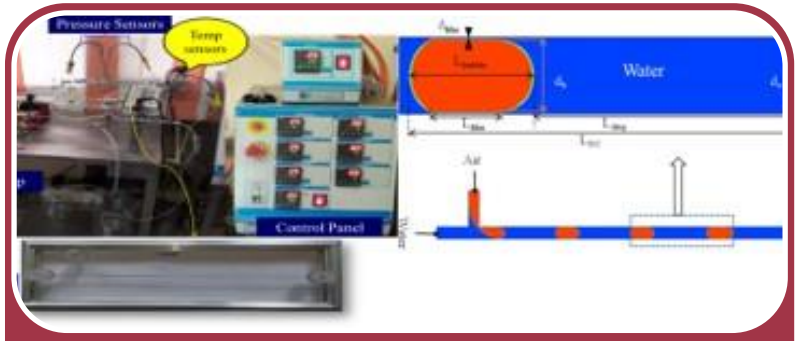


Application 1:

Hydrodynamics in Enhanced Microchannel

Patent (367963) : Gas-Liquid Absorption in Microchannel

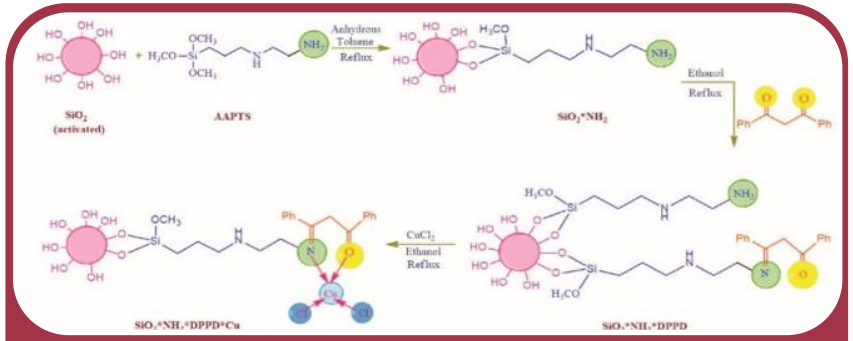
Chem. Eng. Technol. 2022, 45, No. 3, 1–9.



Application 2:

Micro-Reactor & Slug formation in MSR

Chemical Papers (2018) 72:2921–2932



Application 3:

Cu (II)-hybrid synthesis for Wastewater treatment

Chem. Biochem. Eng. Q., 35 (3) 225–250 (2021)

BROAD DESCRIPTION OF THE BANDWIDTH/AREA OF RESEARCH

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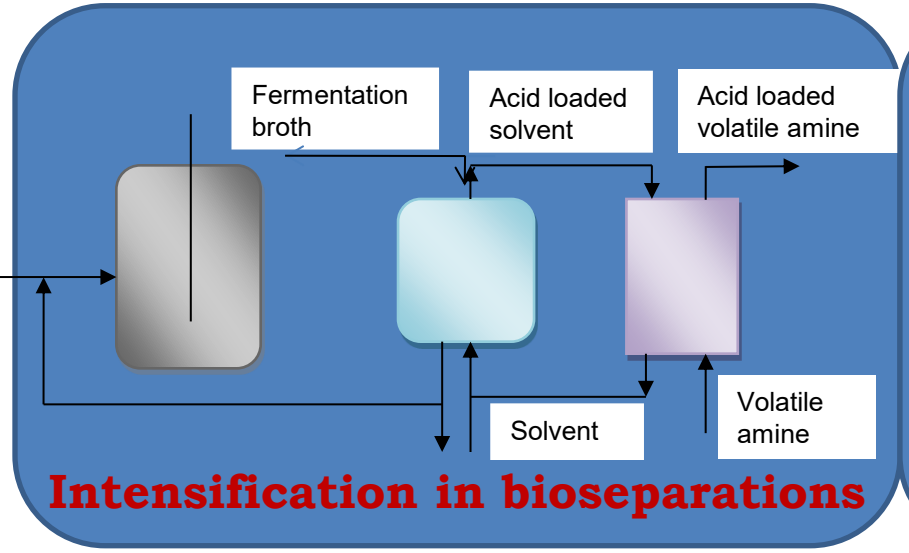
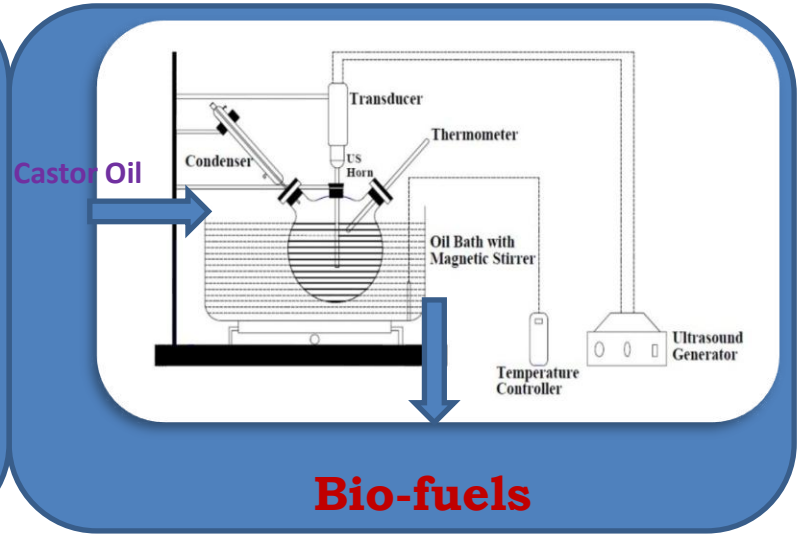
Research Areas/Focus:

1. **Process Intensification:** Intensification in bio-separations using Reactive Extraction; Microwave/Ultra-sonication assisted Extraction.
2. **Wastewater Treatment:** Bioremediation; Electro-coagulation and electrochemical oxidation.
3. **Bio-fuels and Biopolymers:** Production of bio-fuels and bio-polymeric nano-materials



Intensification in bioseparations

Wastewater Treatment



Bio-fuels

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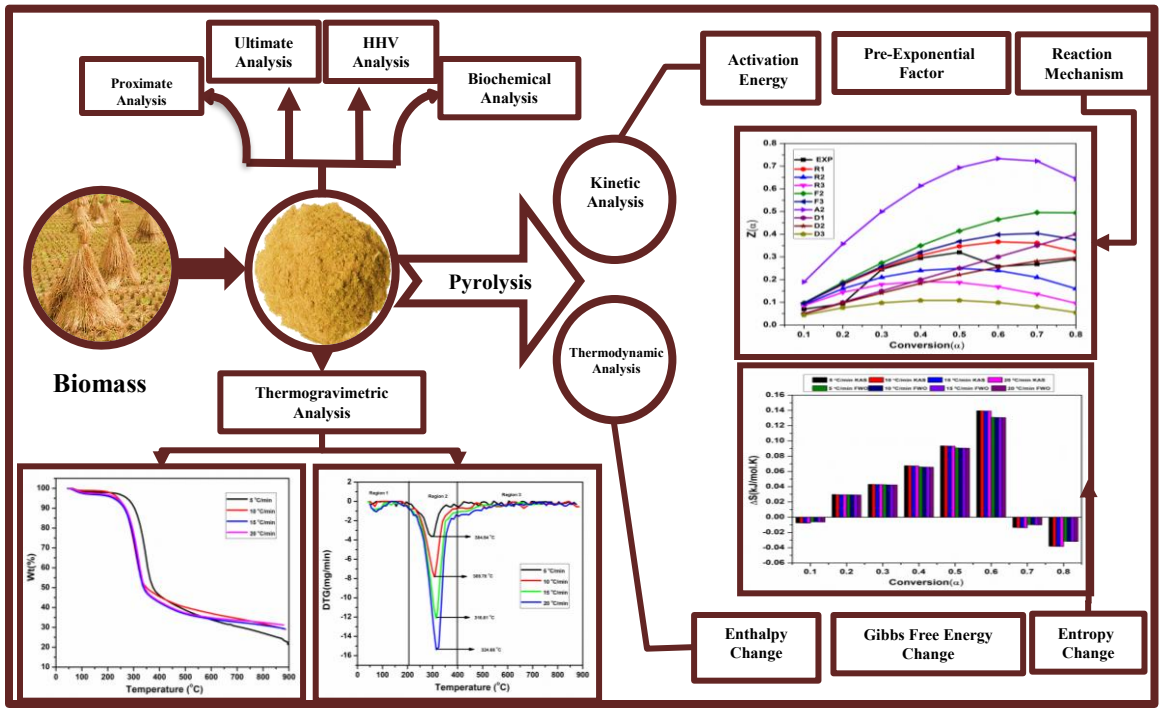
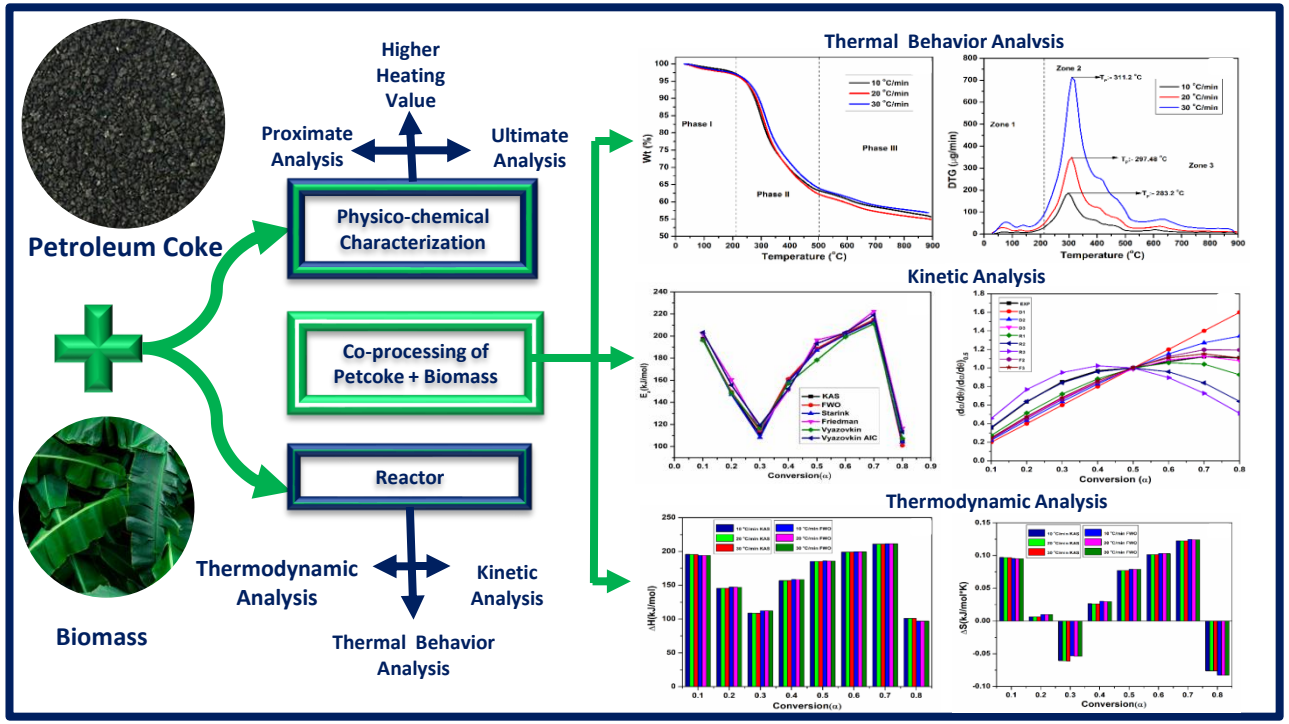
http://www.mnnit.ac.in

Research Areas/Focus:

1. **Biomass Utilization:** Pyrolysis; Kinetic modeling; Thermodynamic analysis
2. **Biochar:** Production, Modification & Characterization; Applications
3. **Valorization of heavy feedstocks in petroleum refineries:** Gasification; Co-processing with agro-residues; Hydrogen-based economy



Pyrolysis and co-pyrolysis of biomass



Biochar production **Valorization of heavy feeds in petroleum refineries**

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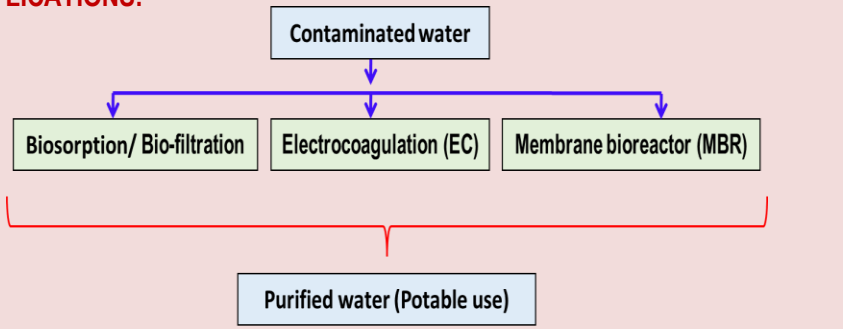
E-mail: suantakk@mnnit.ac.in , Telephone: 05322271589(O)/ 07565942699(M)

RESEARCH AREA/ FOCUS:

1) Water/ Wastewater Treatment

Purifications of contaminated water using various treatment methods for the purpose of potable use or drinking water as per the norms

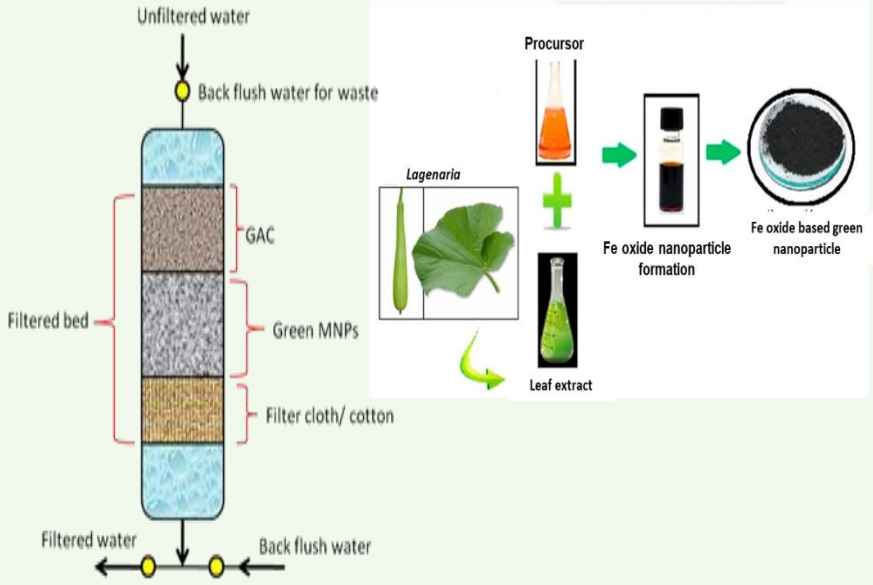
APPLICATIONS:



2) Bio-chemical and Bio-nano-materials

Synthesis of bio-nanopartices from medicinal herbs for therapeutic applications and biosorption of water pollutants

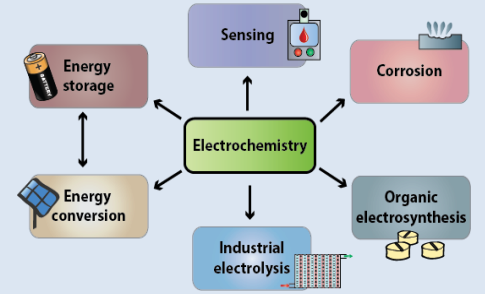
APPLICATIONS:

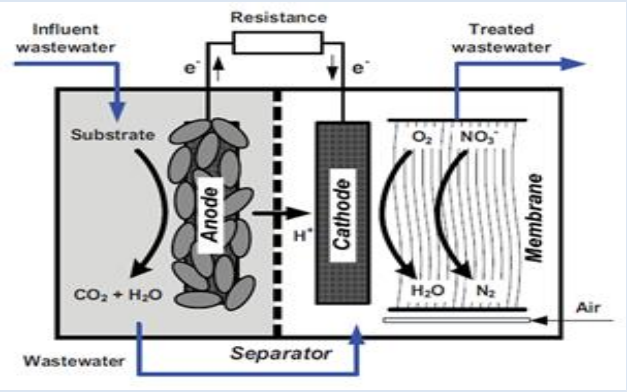


3) Electrochemical Process

Production of bio-electricity using municipal wastewater and removal of organic compounds

APPLICATIONS:





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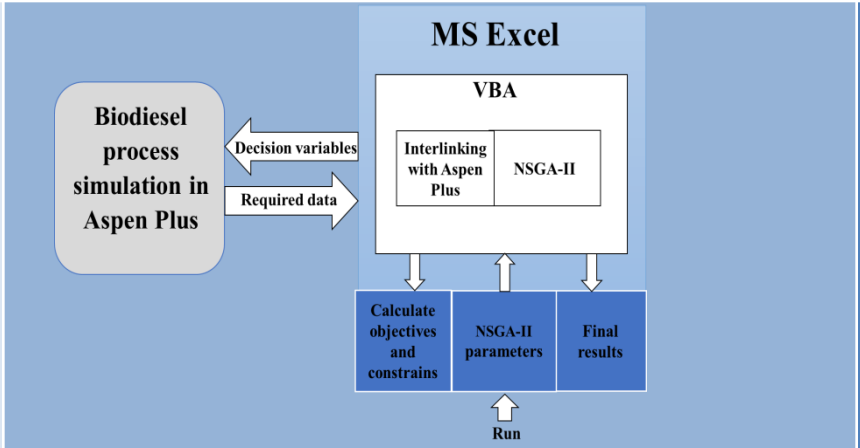
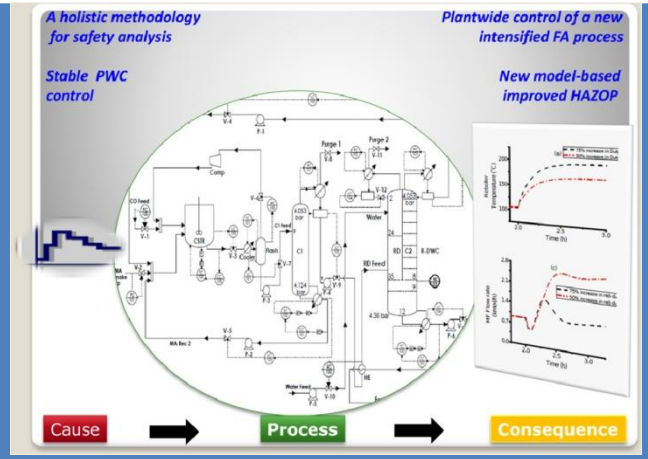
Areas of research

Focus 1: *Biodiesel synthesis using new catalysts*

Focus 2: *Process retrofitting and optimization*

Focus 3: *Plantwide control*





Design and retrofitting of ultrasound intensified and ionic liquid catalyzed in situ algal biodiesel production. Chemical Engineering Research and Design, 171, 2021, 168-185.

Multiobjective optimization of ultrasound intensified and ionic liquid catalyzed in situ algal biodiesel production considering economic, environmental and safety indicators, Chemical Engineering Research and Design, 180, 2022, 134-152.

Plantwide Control and Process Safety of Formic Acid Process having a Reactive Dividing-Wall Column and Three Material Recycles, Computers & Chemical Engineering, 147, 2021, 107248.

Process Systems Engineering

Dr. Karthick Senthilkumar

PDF (IIT Bombay), Ph.D. (NIT Calicut), India

Assistant Professor, Chemical Engineering Department

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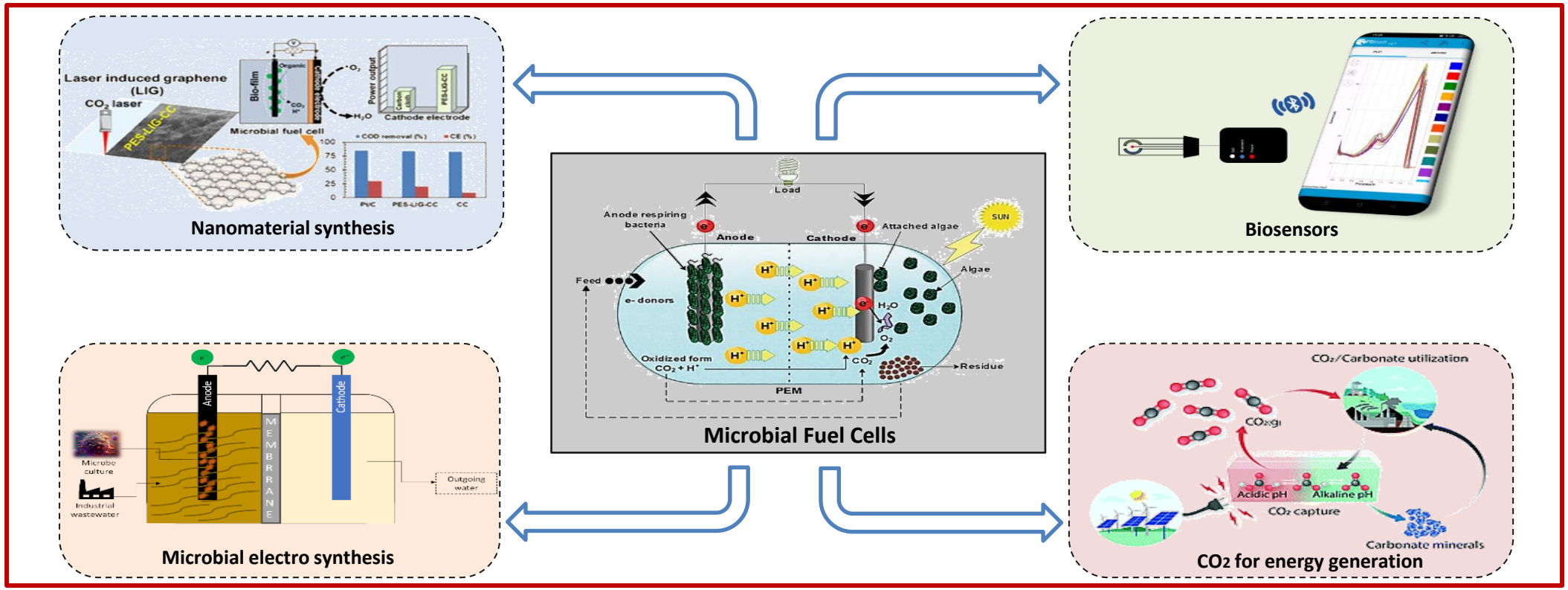
- **Microbial Fuel Cell**: Bio-energy generation and wastewater treatment.
- **Electrochemical cells**: Developing novel electro-catalysts for efficient energy generations.
- **Environmental Nanotechnology** in Biosensor based applications such as water quality monitoring and treatment.
- **Microbial electro synthesis (MES)** for Carbon dioxide (CO_2) conversion into value added products.



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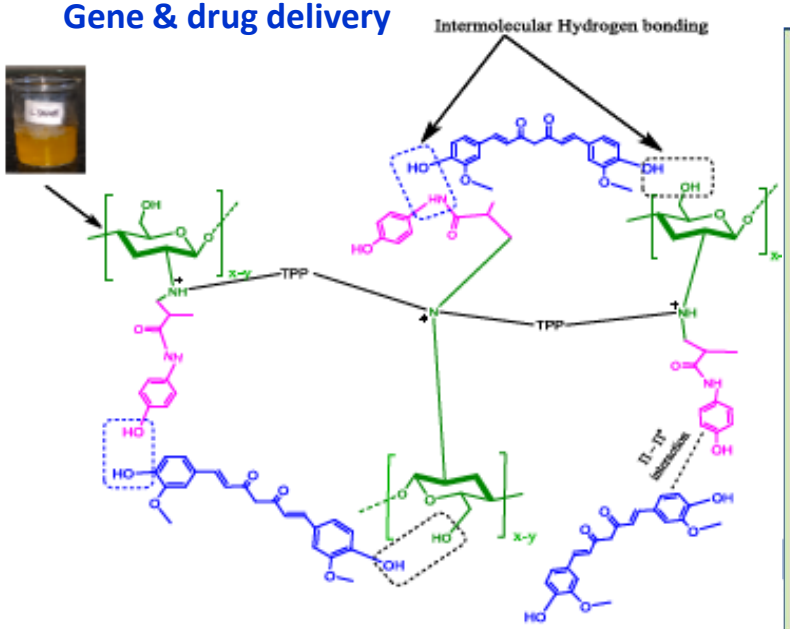
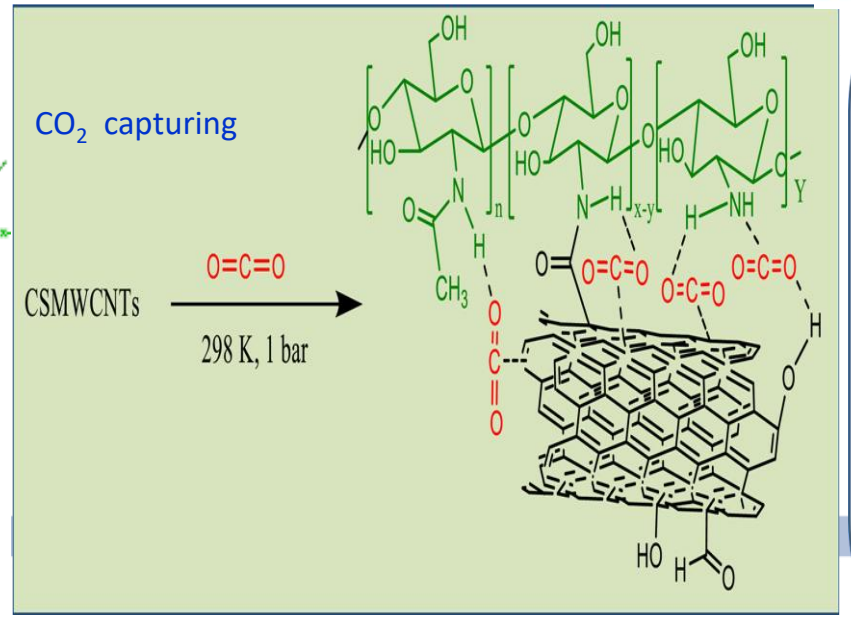
- Polymer Chemistry/Chitin & chitosan
- Biomedical application
- Environmental issues & Food packaging

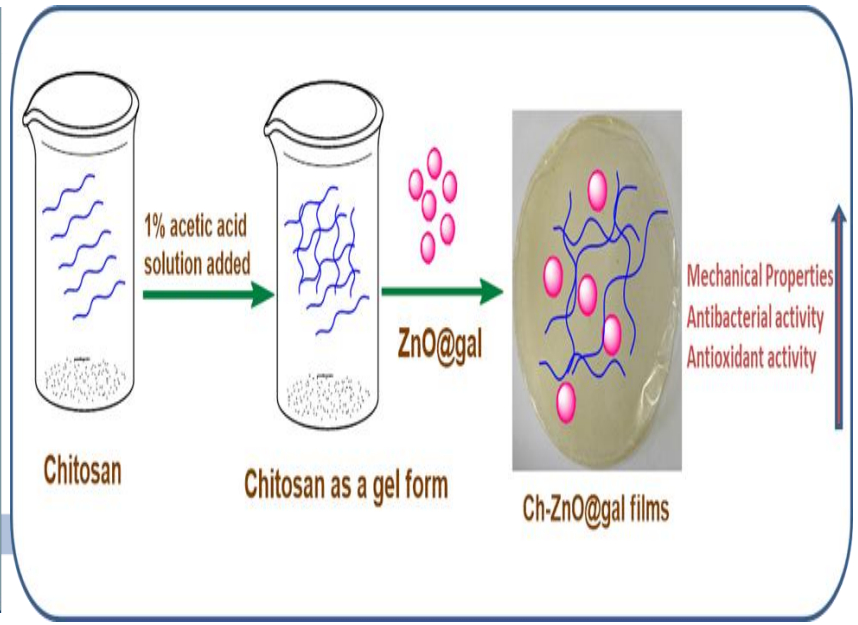
Gene & drug delivery



International Journal of Biological Macromolecules 195, 75–85, 2022



Journal of CO2 Utilization. 41, 101237, 2020



Food Chemistry 334, 127605, 2021

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- **Research Area/Focus 1 : Structure property relationships between metal alkoxides as precursors and their sol-gel derived nano materials**
- **Research Area/Focus 2 : Applications of metal oxide nano materials in bioconjugations and as photocatalysis**
- **Research Area/Focus 3: Metal organic frameworks and their applications**

1. Subia Ambreen. Kiran Gupta. Sadhana Singh. D.K. Gupta. Stephane Daniele. N.D. Pandey. Ashutosh Pandey, Synthesis and structural characterization of some titanium butoxides modified with chloroacetic acids, Transition Metal Chemistry, Aug 2013 (2013) Volume 38 Issue 8 :835–841.
2. D.K. Gupta, S. Singh, Peter Mayer, Ashutosh Pandey, Inorganic Chemistry Communications, Hydrothermal Synthesis, Structure and Photoluminescent Property of a novel Sodium-pyrazinyltetrazole framework compound, Inorganic Chemistry Communications(Elsevier), 14, pp1485–1488, 2011.
3. Ashutosh Pandey, Anjana Pandey, Sadhana Singh, Peter Mayer and Wolfgang J. Parak Synthesis and Structural Characterisation of a Hexanuclear TiIV Compound Ti6 (μ2-O)2(μ3-O)2(μ2-OC4H9)2 (OC4H9)6(OOCCHCl2)8, Z. Naturforsch. 2009 65b, 1 – 5.
4. S. Ambreen., Peter Mayer, N.D. Pandey Ashutosh Pandey, Characterization and photocatalytic study of tantalum oxide nanoparticles prepared by the hydrolysis of tantalum-oxo-ethoxide Ta8(μ3-O)2(μ-O)8(μ-OEt)6(OEt)14" Beilstein Journal of Nanotechnology 2014, 5, 1082–1090.
5. Evaluation of low cost immobilized support matrices in augmentation of biohydrogen potential in dark fermentation process using B. licheniformis AP1, Priya Rai , Ashutosh Pandey , Anjana Pandey ,* Fuel 310 (2022) 122275. Published online on 21 Oct 2021.

1. Mohd. Danish, Subia Ambreen, Arti Chauhan, Ashutosh Pandey, Optimization and comparative evaluation of optical and photocatalytic properties of TiO2 thin films prepared via sol–gel method, 2015, Volume: 19 Issue: 5 Pages: 557-562, Journal of Saudi Chemical Society.
2. S. Ambreen, Mohd. Danish, N. D. Pandey, Ashutosh Pandey Investigation of the photocatalytic efficiency of tantalum alkoxy carboxylate-derived Ta 2 O 5 nanoparticles in rhodamine B removal Beilstein Journal of Nanotechnology, 2017, 8, 604–613.
3. Kamini Gupta, Jatineder kumar, R. P. Singh, Anjana Pandey, Priya Rai and Ashutosh Pandey "Standardised nanostructured Ta/N-TiO2 for environmental contaminants: an efficient visible light induced photochemical quencher for dyes"; Materials Technology Advance Performance Materials ; Pages 765-775 , 2019.
4. Photocatalytic antibacterial performance of TiO2 and Ag-doped TiO2 against S. aureus. P. aeruginosa and E. coli, Kiran Gupta , R. P. Singh , Ashutosh Pandey and Anjana Pandey, J. Nanotechnol. 2020, 11, 547–549.
5. Fabrication of tantalum oxyfluoride and oxynitride thin films via ammonolysis of sol–gel processed tetraethoxo (b-diketonato) tantalum (V) precursors for enhanced photocatalytic activity Mohd. Danish , Ashutosh Pandey,* ,Aftab Aslam Parwaz Khan and Abdullah M. Asiri, J Mater Sci: Mater Electron (2021) 32:10564–10578
6. Effect of chelation in alkoxide precursors of niobium oxide nanoparticles on photochemical degradation of rhodamine B Subia Ambreen N. D. Pandey Arti Chouhan Hemaunt Kumar Ashutosh Pandey Journal of Sol-Gel Science and Technology (2021) 98:319–334

1. S Singh, D K Gupta, H Noeth, Ashutosh Pandey, Journal of Chemical Crystallography, Synthesis, Characterization and Photoluminescent Property of a Trinucleated Cadmium (II) Coordination Polymer Involving in Situ Ligand Reaction Volume 43, Issue 2 Page 82-90 Feb. 2013
2. Arti Chouhan, Guillaume Pilet, Stéphane Daniele and Ashutosh Pandey" Shape controllable preparations of submicronic cadmium tetrazole-based MOFs via solvothermal or microwave-assisted methods and their photocatalytic studies" Volume 35, Issue 2, February, 2017, Pages 209–216 Chinese Journal of Chemistry (Wiley – VCH) 2016.
3. Arti Chouhan, Peter Mayer & Ashutosh Pandey, Synthesis, crystal structure, photoluminescence and photocatalytic property of a new three dimensional Zinc(II) tetrazole framework, Volume 127, Issue 9 (2015), Page 1599-1606, Journal of Chemical Sciences (Springer).
4. Deepak Kumar, Erwann Jeanneau, Shashank Mishra, Ashutosh Pandey, Syntheses and characterizations of calcium and strontium based coordination compounds with the 5-(2-pyridyl)tetrazolate ligand respectively exhibiting extended 1 D and 2 D structures, Journal of Molecular Structure 2022 in press.

Dr. Tamal Ghosh

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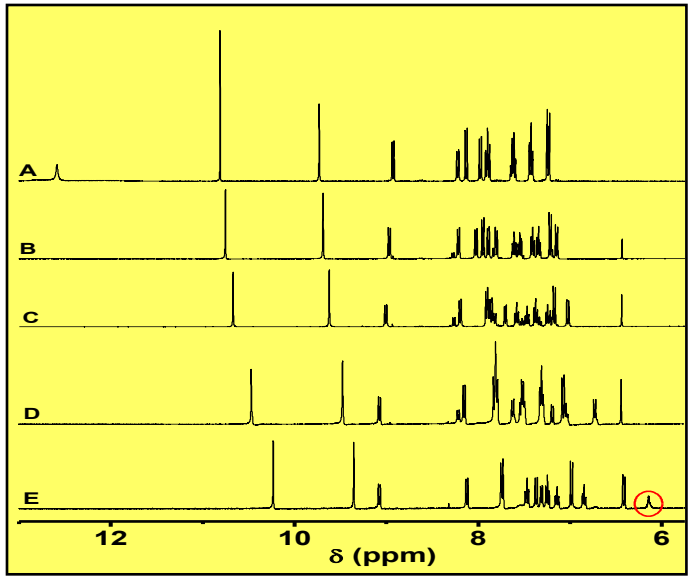
- **Sensing of Charged Analytes**
- **Photochemistry**

Detection of cation/anion/molecule by change in colour or fluorescence



Investigation of binding mechanism by ^{1}H NMR spectra

Dr. Bhaskar Devu Mukri

Ph.D., IISc Bangalore, India

Assistant Professor, Department of Chemistry

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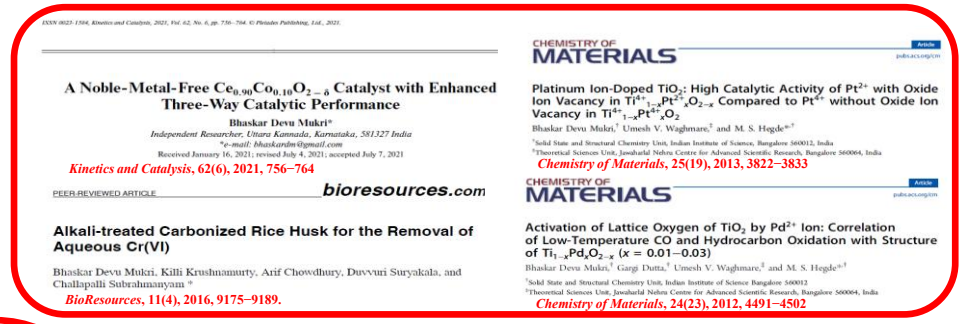
- **Solid State Chemistry and Heterogeneous Catalysis**
- **Waste Valorization**
- **Water purification**



A Noble-Metal-Free $Ce_{0.90}Co_{0.10}O_{2-\delta}$ Catalyst with Enhanced Three-Way Catalytic Performance

Bhaskar Devu Mukri*

Kinetics and Catalysis, 62(6), 2021, 756–764

Platinum Ion-Doped TiO_2: High Catalytic Activity of Pt^{2+} with Oxide Ion Vacancy in $Ti^{4+}_{1-2x}Pt^{2+}_{x}O_{2-x}$ Compared to Pt^{4+} without Oxide Ion Vacancy in $Ti^{4+}_{1-x}Pt^{4+}_{x}O_2$

Bhaskar Devu Mukri, Umesh V. Waghmare, and M. S. Hegde*

Chemistry of Materials, 25(19), 2013, 3822–3833

Alkali-treated Carbonized Rice Husk for the Removal of Aqueous Cr(VI)

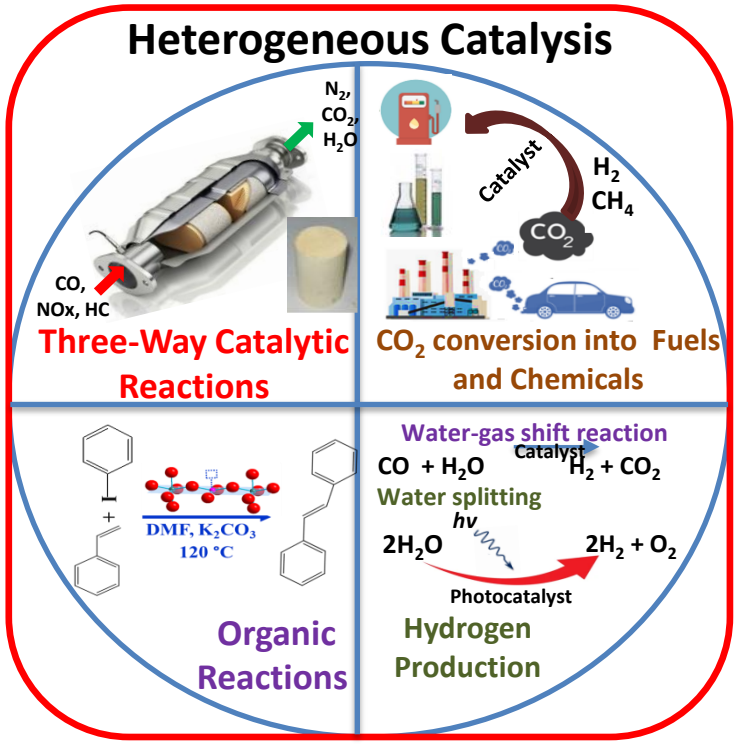
Bhaskar Devu Mukri, Killi Krushnamurty, Arif Chowdhury, Duvvuri Suryakala, and Challapalli Subrahmanyam

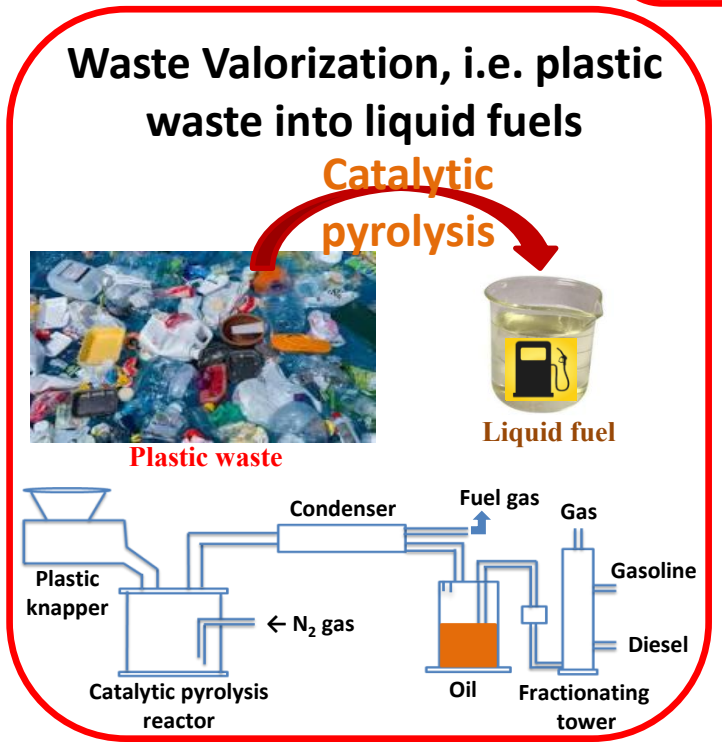
BioResources, 11(4), 2016, 9175–9189.

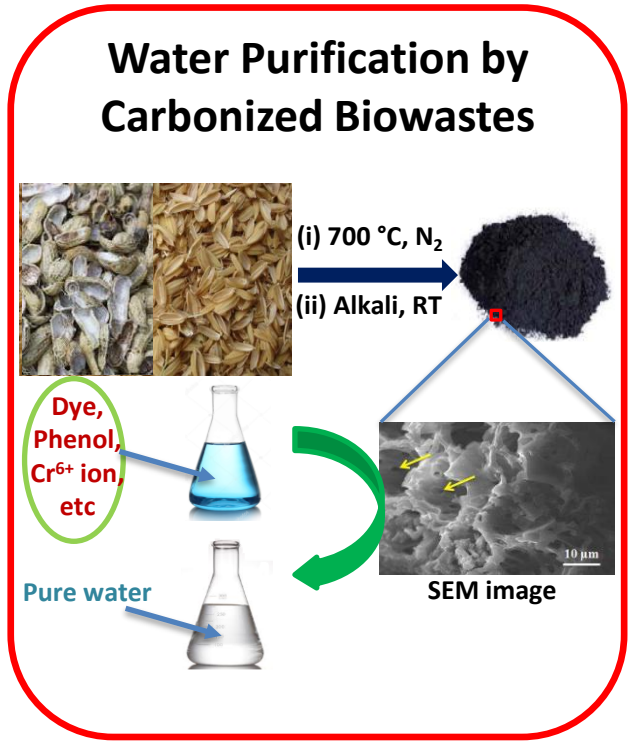
Activation of Lattice Oxygen of TiO_2 by Pd^{2+} Ion: Correlation of Low-Temperature CO and Hydrocarbon Oxidation with Structure of $Ti_{1-x}Pd_xO_{2-x}$ ($x = 0.01–0.03$)

Bhaskar Devu Mukri, Gargi Dutta, Umesh V. Waghmare, and M. S. Hegde*

Chemistry of Materials, 24(23), 2012, 4491–4502







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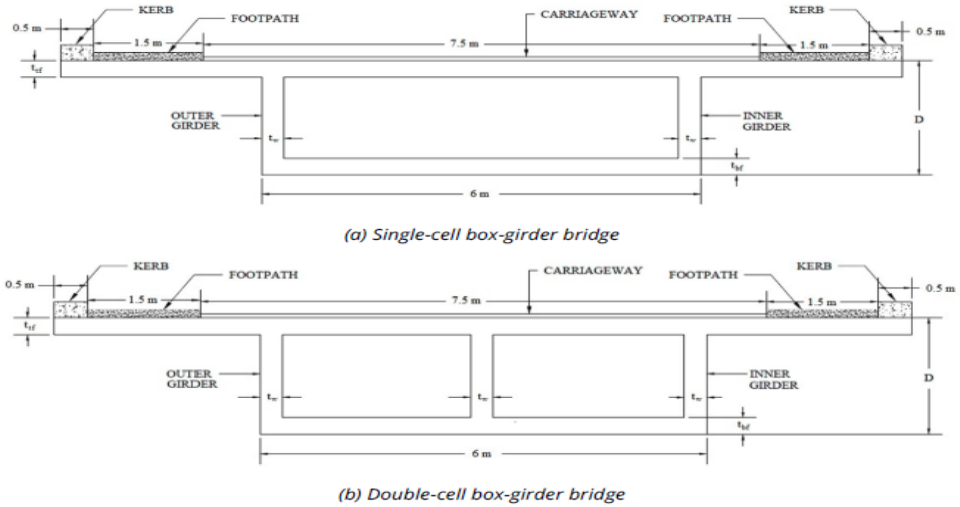
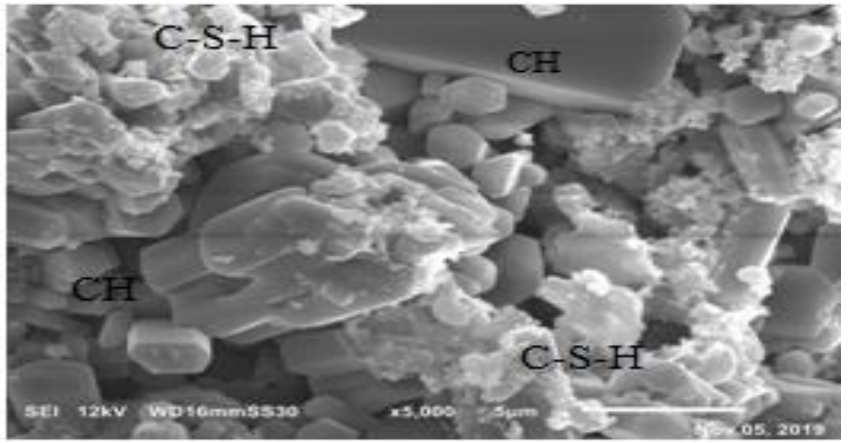
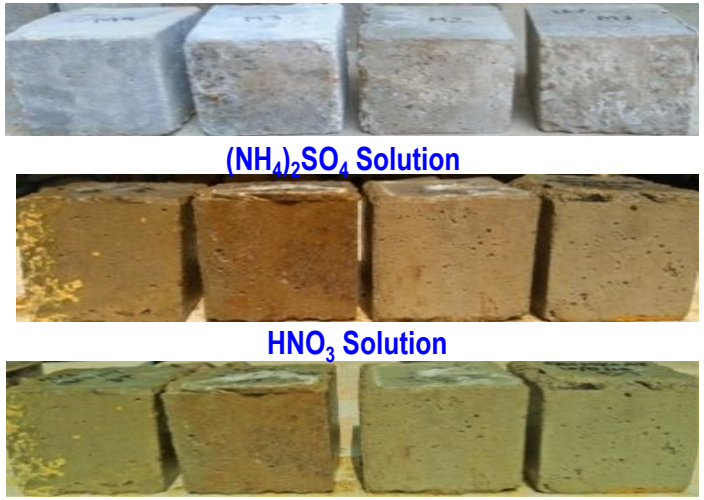
- **Bridges/** Cable stayed, Pre-stressed & RC Box girder, Integral.
- **Concrete**/ Sustainable Concrete & Durability Assessment



RC Box-Girder Bridge Deck Model



SEM of Fly-ash mixed SCC



$(NH_4)_2SO_4$ Solution

HNO_3 Solution

H_2SO_4 Solution

Concrete Exposed to Sulphate & Acids

Structural Engineering

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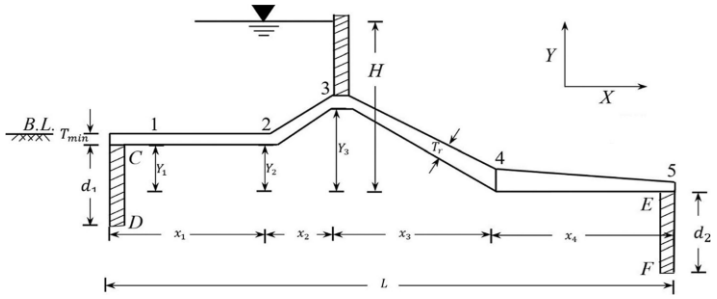
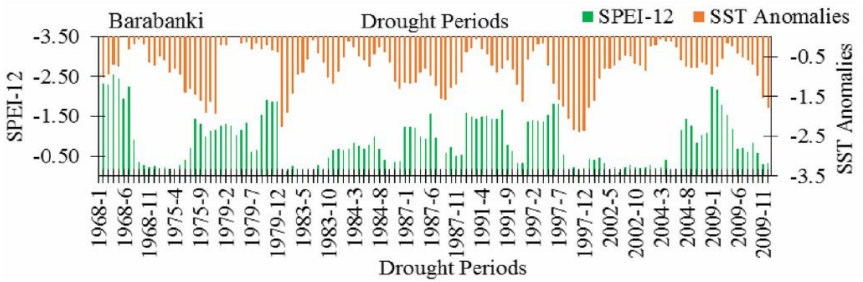
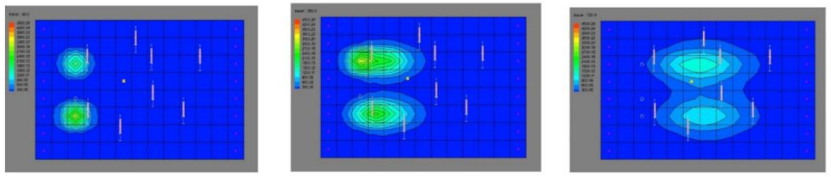
- **Design of hydraulic structures /Irrigation structures/optimization applications in water resources**
- **Hydrological and climate modelling/droughts characterization/SST**
- **Groundwater management/ contaminant flow and transport/Hydro environment.**



Optimal Design of Barrage profile



Hydrological drought characterization and correlation with SST (Sea Surface Temperature) and El Nin˜o-Effects



(a) 90 Days (b) 360 Days (c) 720 Days

Simulated plume behaviour at different time steps in groundwater aquifer system

Water Resources Engineering [Hydro-Environmental Systems, Hydrology, Hydraulics and and Climate Change]

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Associate Professor, Dept. of Civil Engineering
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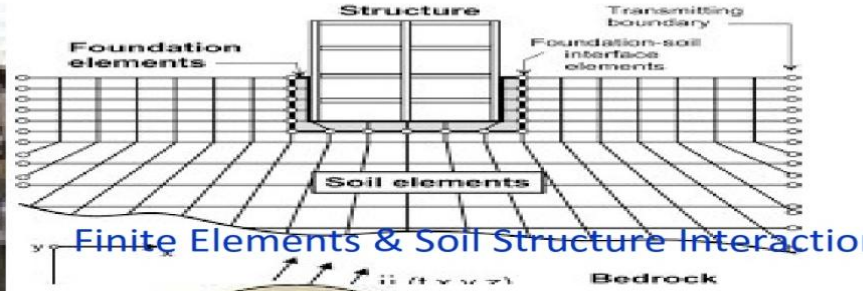
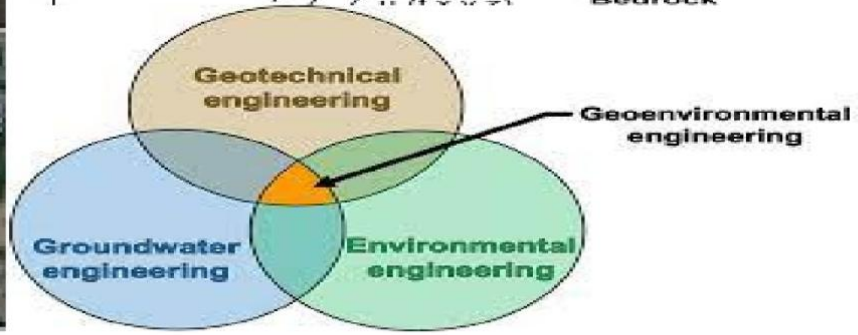
- Geotechnical Engineering, Geotechnical Earthquake Engineering/Soil Dynamics
  - Finite Elements in Geotechnical Engg. & Soil-Structure Interaction
    - ANN & ANFIS, Geo-Environmental Engg. & Waste Management



Finite Elements & Soil Structure Interaction



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Solid waste management,

Water and Wastewater Treatment

Air Pollution

ASCE

Approach for the Assessment and Ranking of Hospitals Based on Waste Management Practices Using RIAM, Sustainability, and EPI Techniques

Ria Ranjan Srivastava[1] and Nekram Rawal[2]

Abstract: An environmental impact assessment (EIA) tool is used to assess any proposed development activity. It is beneficial for a detailed study of large projects, but less feasible for quick assessments of a smaller project. The rapid impact assessment matrix (RIAM) serves the pur-

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Technical Papers

Municipal Solid Waste Management Using Multiobjective Optimization with Uncertain Parameters

Vinal Singh; Raj Mohan Singh, Ph.D., M.ASCE; and Nekram Rawal, Ph.D.

SECTIONS

Abstract

Municipal solid waste (MSW) management involves economic and technical aspects and regulatory normative constraints. The selection of an optimal

Desalination and Water Treatment
www.deswater.com
doi: 10.5004/dwt.2017.21385

88 (2017) 145–153
September

Studies on natural biogenic iron oxides for removal of copper (II) ion from aqueous solution

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Received 25 February 2017; Accepted 26 August 2017

ABSTRACT

In the past few decades, presence of heavy metals such as copper has increased in the environment

Int. J. Environment and Pollution, Vol. 66, Nos. 1/2/3, 2019 127

An approach for selection of solid waste disposal sites by rapid impact assessment matrix and environmental performance index analysis

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Abstract: The selection of landfill sites for disposal of municipal solid

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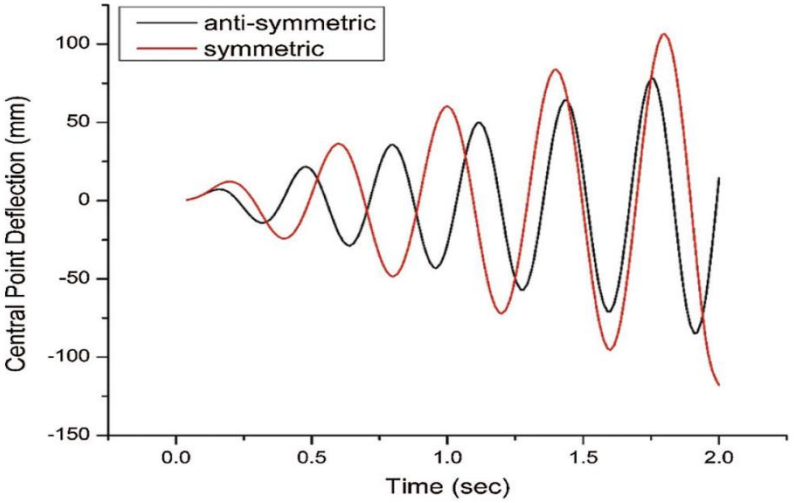
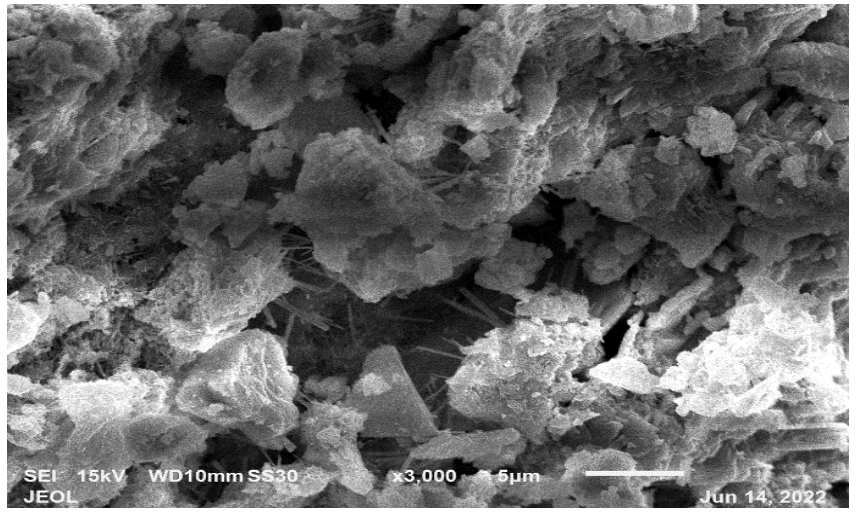
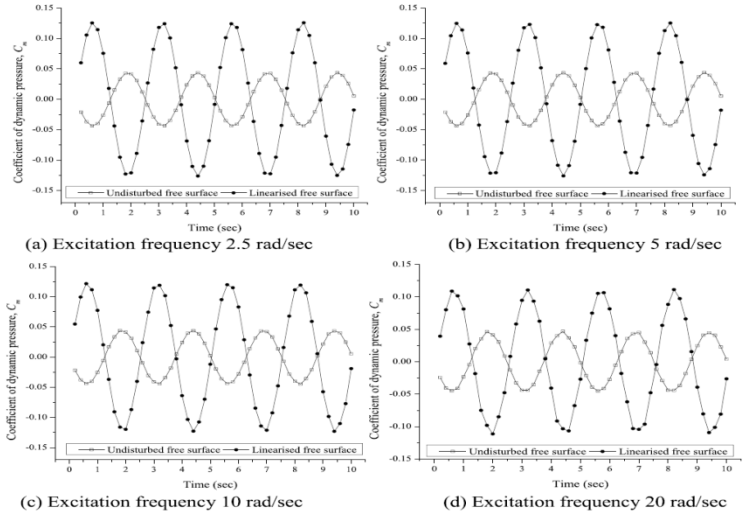
- **Composite/Progressive Failure Analysis of Laminated Plates using FEM**
- **Concrete/Dynamic Properties of Concrete, High Performance Concrete & Concrete Bridges**
- **Fluid-Structure Interaction/Sloshing of Liquid & Analysis of Lock Gate Structure using FEM**



Deflection of anti-symmetric and symmetric cross-ply laminates



SEM image of WTS based mortar



Dynamic pressure at different excitation frequencies

Structural Engineering

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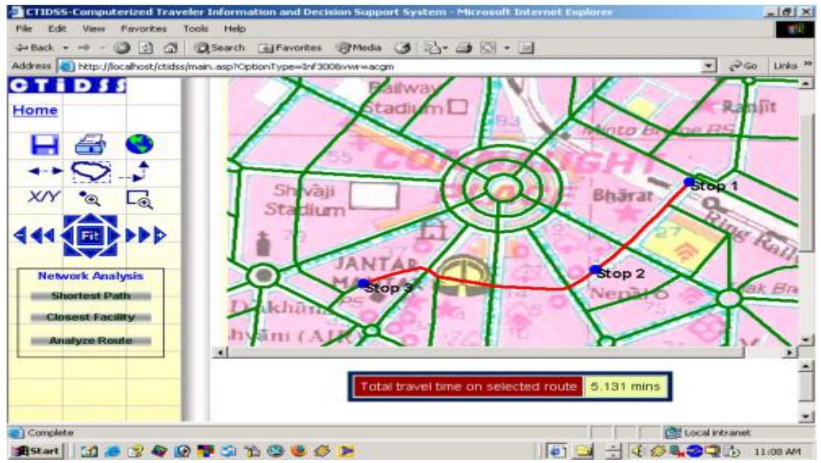
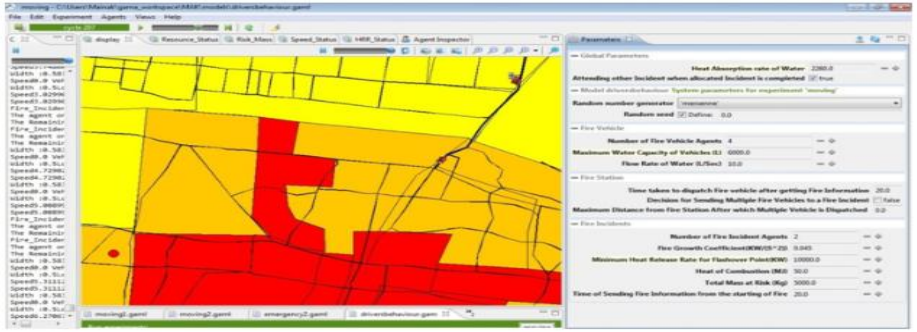
- **Intelligent Transportation Systems: Advanced Traveller Information System (ATIS), Sensor Based Traffic Data Acquisition and Congestion Detection**
- **Agent Based Geosimulation**
- **Accessibility Analysis for Public Transport System**

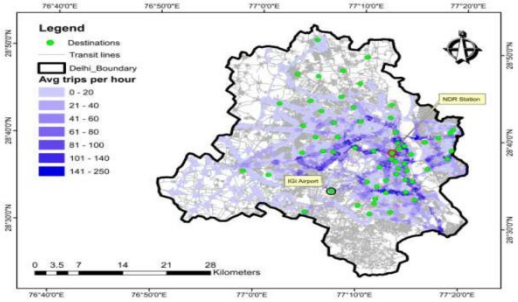


Route Planning through ATIS

Congestion Detection Using Sensors Equipped Probe Vehicle



Agent based model for fire emergency response



Public transit frequency of bus service in NCT of Delhi

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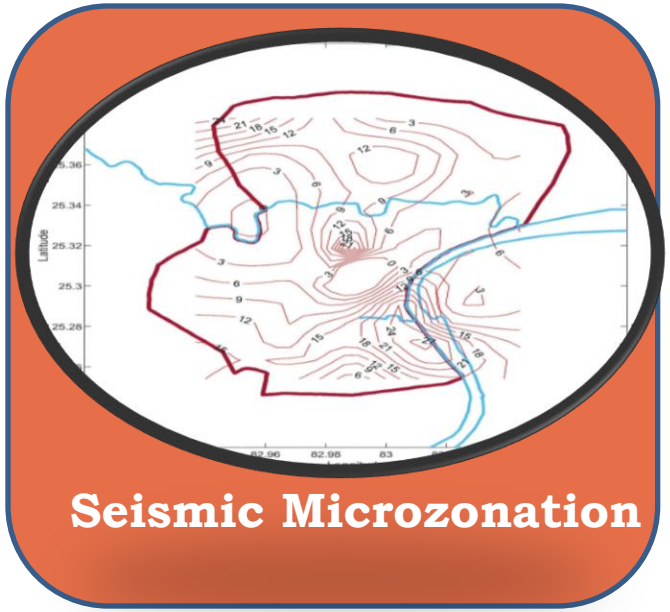
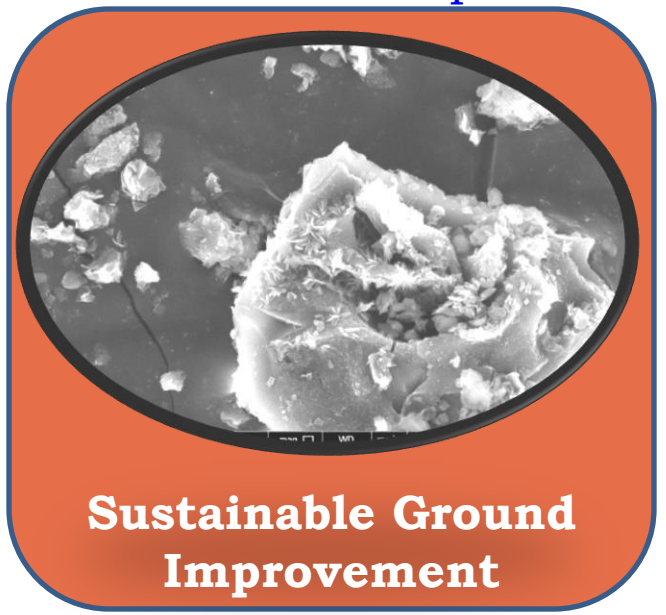
Research Area/Focus:

1. Geotechnical Engineering: Site Investigation, Non-Destructive sub-surface exploration, Seismic hazards analysis & microzonation, Ground improvement & Design of sub-surface structures.
2. Geoenvironmental Engineering: Risk assessment & Remediation of contaminated soil, sediments, and groundwater, Sustainable waste management.
3. Design & Development of low cost and automated equipments for faster sub-soil exploration .





Dr. Vijay Kumar

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Assistant Professor, Dept. of Civil Engineering

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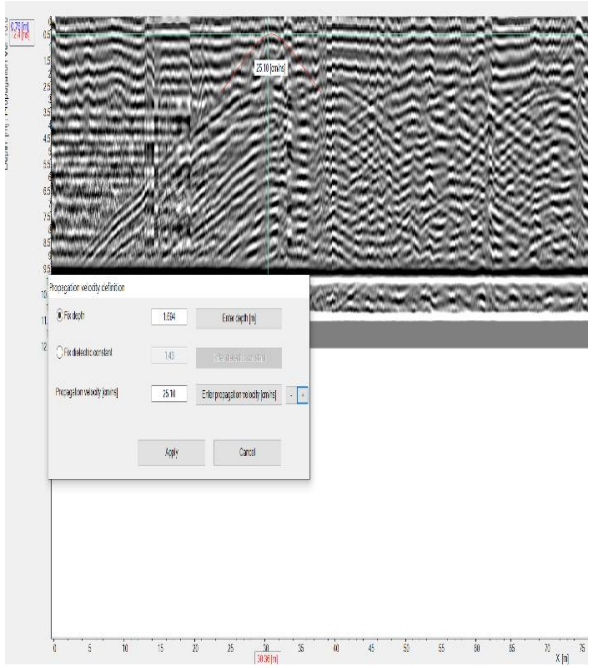
- **Analysis and Design of Foundation.**
- **Soil Structure Interaction.**
- **Application of Soft Computing Techniques in Geotechnical Engineering.**



Geotechnical Engineering

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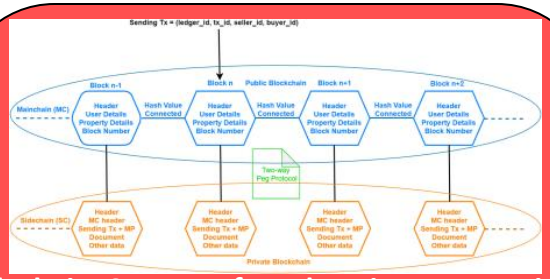
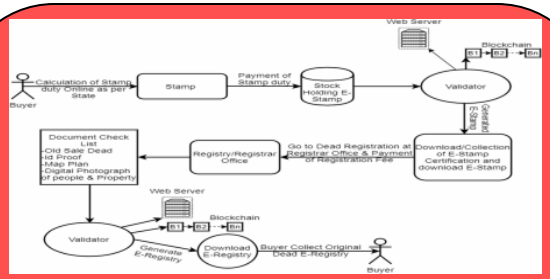
- **Distributed Ledger Technology (DLT) & Blockchain**
- **Cloud Computing & Distributed System**
- **Internet of Things & Image Processing**
- **Software Engineering**

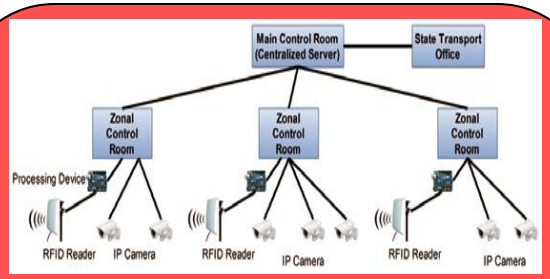


Sidechain: Storage of Land Registry Data using Blockchain for Improved Performance

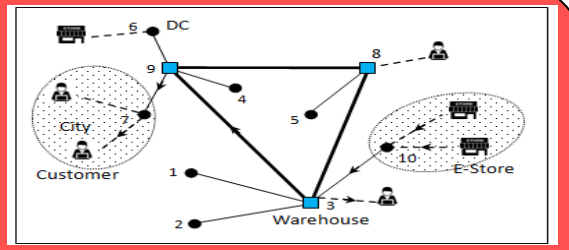
Cluster Computing (2022) 25:1475–1495
Springer Science & Business Media, LLC,



Blockchain-based Digitization of Land Record through Trust Value based Consensus Algorithm
Peer-to-Peer Networking and Applications (2021) 14:3540–3558
https://doi.org/10.1007/s12083-021-01207-1



An Intelligent Reconnaissance Framework for Homeland Security
Defence Science Journal, Vol. 69, No. 4, July 2019, pp. 361-368



Solving the e-Commerce Logistics Problem using Anti-Predatory NIA
Int. J. Intelligent Engineering Informatics, Vol. 8, No. 1, 2020

Distributed Ledger Technology (DLT) , Blockchain Technology, Cloud Computing & Distributed System

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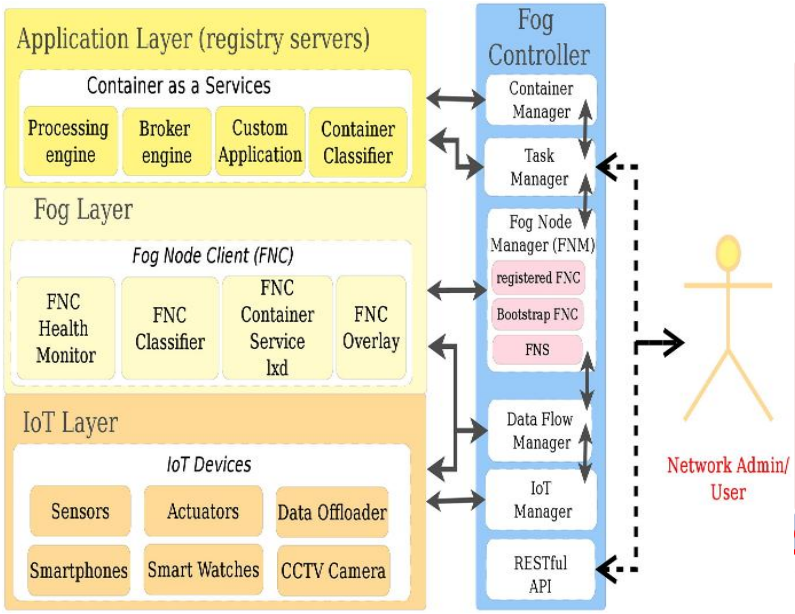
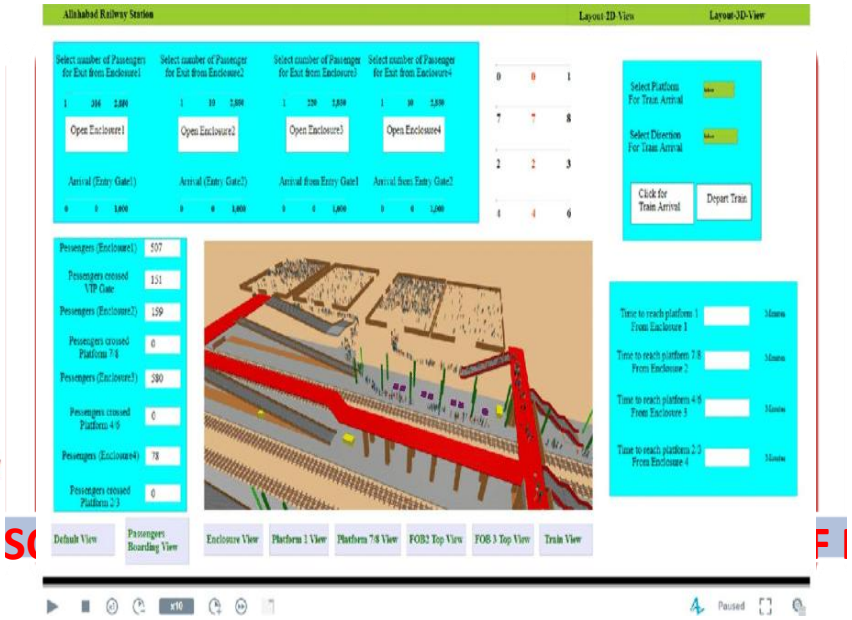
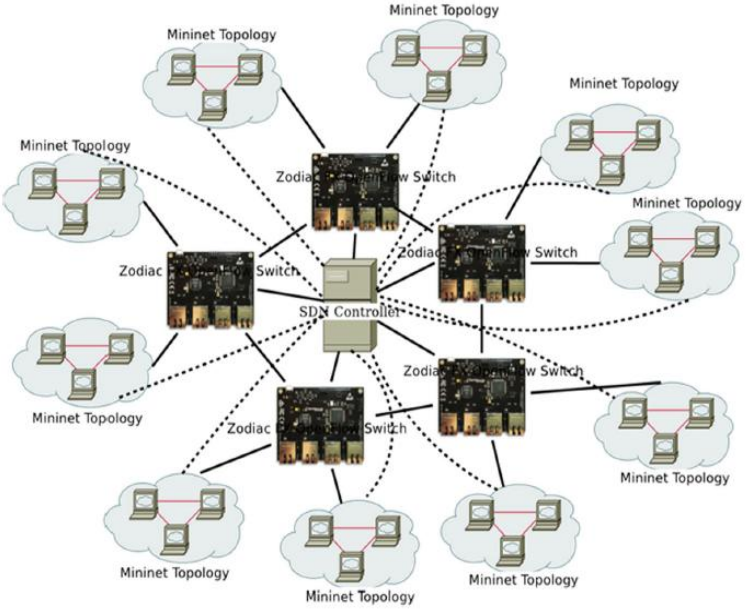
- **Fog/Edge Computing**
- **Software-Defined Network**
- **Video Analytics for Crowd Management and Control**







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- **Software Engineering/ Software Testing**
- **Meta-heuristics Algorithms/ Grey Wolf Optimizer**
- **Optimization Techniques/ Clustering in WSN using MADM**

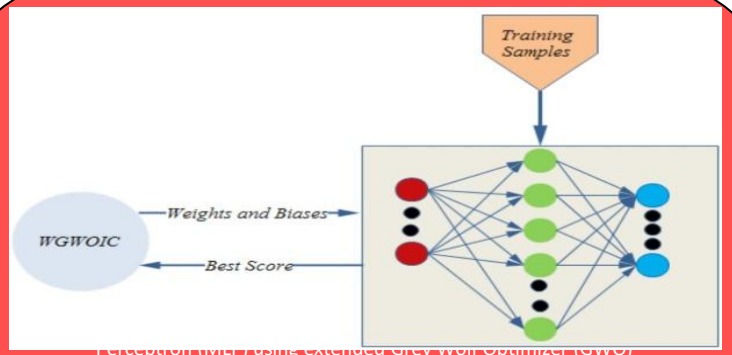
Algorithm 1 MODE-HBM

Input:
$f_m, m = 1, 2, ...M$. MOP with M objectives
S^D = Search space of D decision variables
ITR = Maximum Number of Iterations
Output:
New population
Begin Procedure
for i = 1 to N
Initialize each solution α_i randomly with in respective search space range.
Apply nondominated sorting and assign ranks to solutions according to their pareto front number
Apply Homeostasis mutation: $\gamma_{i,G} = \alpha_{best,G} + \delta_1 \cdot (\alpha_{r_1^i,G} * Hv - \alpha_{r_2^i,G} * Hv)$
Apply crossover
Evaluate each solutions fitness for $f_m(\alpha_i)$, $m = 1, 2, ..., M$
Apply selection and first keep good rank solutions, in case of tie solution choose solution with higher crowding distance
End for
End Procedure

Proposed a Multi-objective Differential Evolutional (DE) algorithm to software cost estimation.

(Springer) Applied Intelligence,

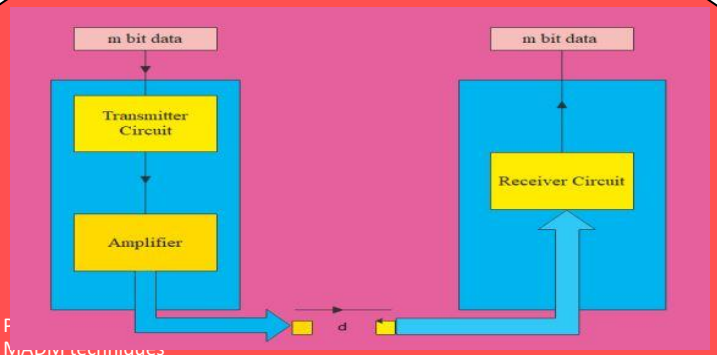
DOI: https://doi.org/10.1007/s10489-017-0980-6



Perceptron (MLP) using Extended Grey Wolf Optimizer (GWO)

Jordanian Journal of Computers and Information Technology, 2021

DOI: 10.5455/jjcit.71-1621353647



MADM techniques

Springer International Journal of Information Technology, 2022,

DOI: https://doi.org/10.1007/s41870-022-00878-0

Optimization techniques to solve Software Engineering Problems, Multi-layer Perceptron in neural network, and efficient clustering in WSN

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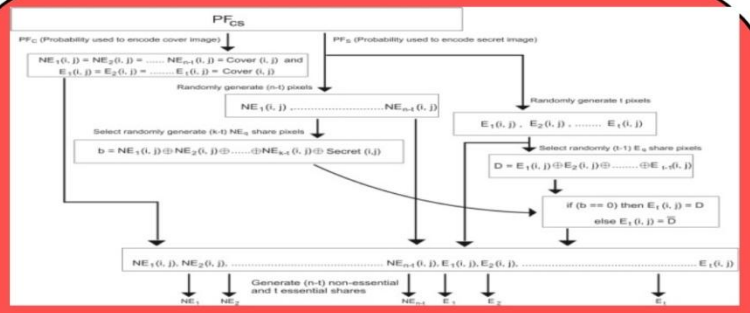
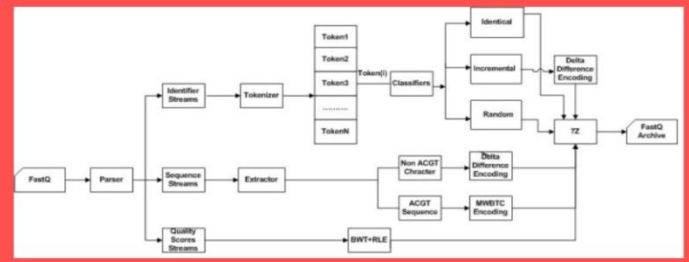
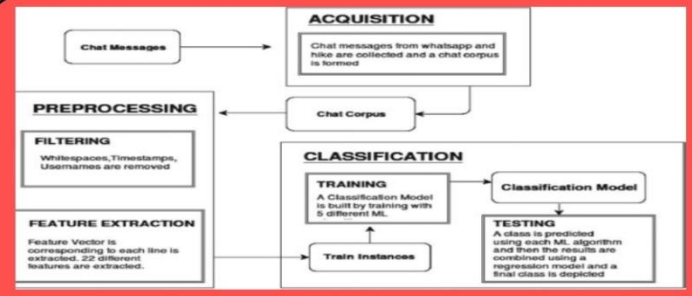
- Energy Aware Real time System
- Visual Cryptography
- Machine Learning & Data Compression



Essential secret image sharing approach with same size of meaningful shares. (Springer) International Journal of Multimedia Tools and Applications. 2021 DOI: https://doi.org/10.1007/s11042-021-10625-5



WBFQC: A New Approach for Compressing Next-Generation sequencing data splitting into homogeneous streams", Journal of Bioinformatics and Computational Biology- World Scientific. vol. 16, issue no. 5, 1850018-1850018, 2018 (SCIE Indexed)
DOI: 10.1142/S021972001850018X



Impostor Detection Through Chat Analysis, (Elsevier, Procedia Computer Science 89 (2016) https://doi.org/10.1016/j.procs.2016.06.097

Multimedia Security using Visual Cryptography, Compression of Genomic Data ,& Machine Learning

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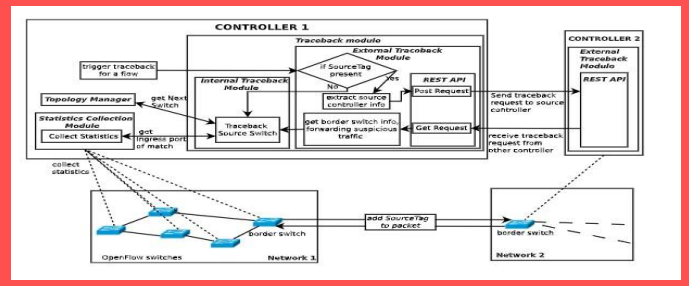
- **Software Defined Network & its Security**
- **Network and Cyber Security**
- **Artificial Intelligence Enabled Security**



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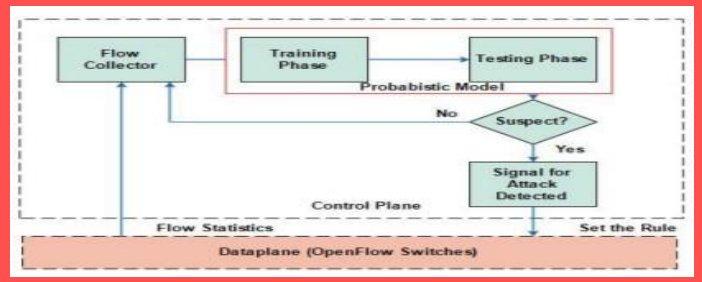
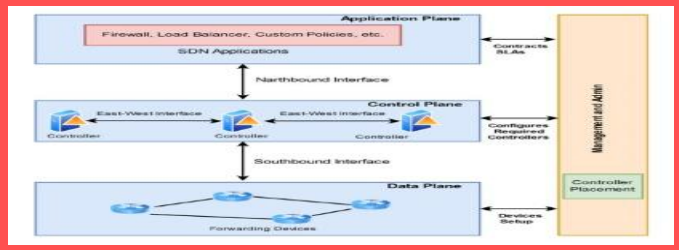


Proposed a Probabilistic Technique for DDoS Detection in OpenFlow Controller

IEEE Systems Journal , 2021

DOI: 10.1109/JSYST.2021.3110948



Design the mathematical model for the Controller Placement Problem (CPP) and Reliable CPP (RCPP) in SDN ,Springer Journal of Ambient Intelligence and Humanized Computing ,2022,

https://doi.org/10.1007/s12652-022-03733-z

Artificial Intelligence Enabled Security of SDN, NDN, ICN, IoT and Adversarial Machine Learning

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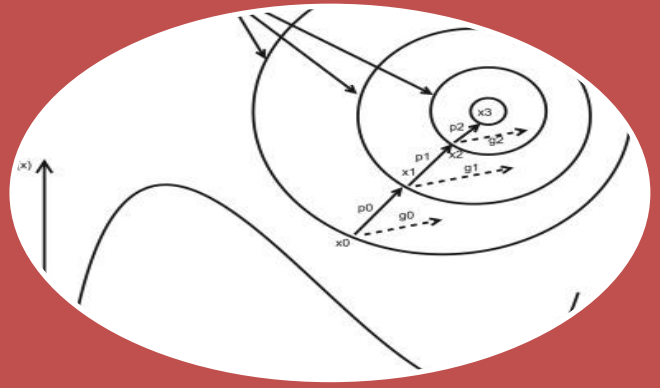
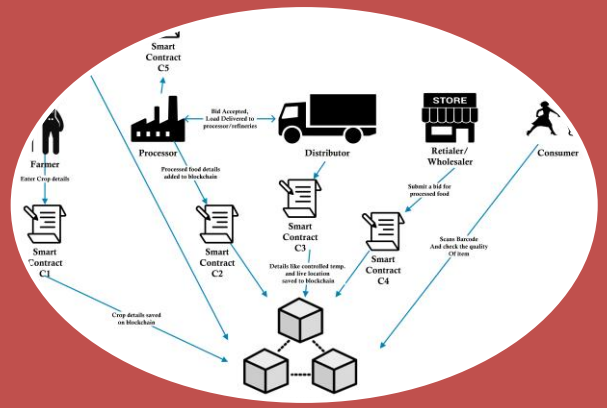
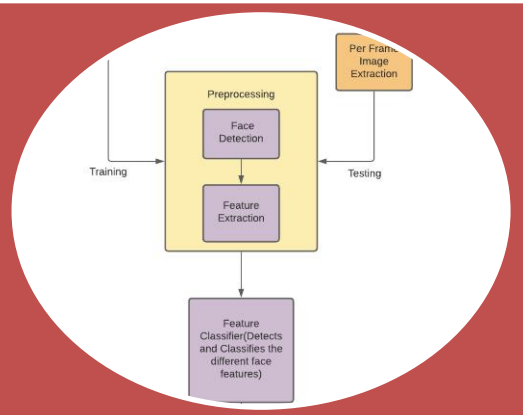
- **Optimization Using Evolutionary Algorithms**
- **Commercial and Medical Applications of Blockchain & Internet of Things**
- **Machine Learning and Artificial Intelligence**



Portfolio Optimization Using Novel Co-variance Guided Artificial Bee Colony Algorithm



A Blockchain Point of View of Supply Chain Problems in India



Gauging Stress Among Indian Engineering Students

Artificial Bee Colony Algorithm, Supply Chain Over Blockchain, Video Based Stress and Depression Detection

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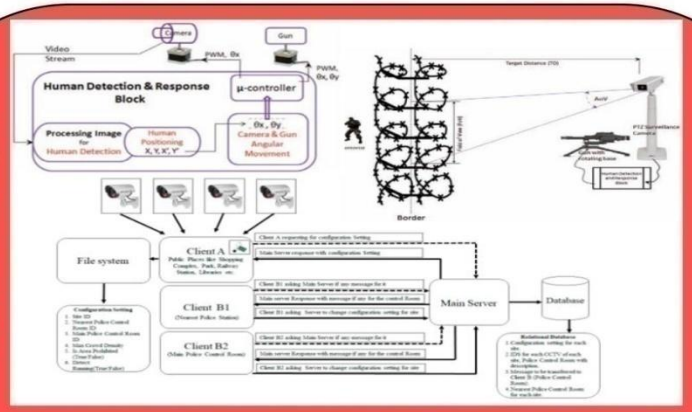
- Machine Intelligence and Computer Vision
- Human Computer Interaction
- Embedded System Design & Internet of Things (IoT)

Real-time Surveillance



CPS Design

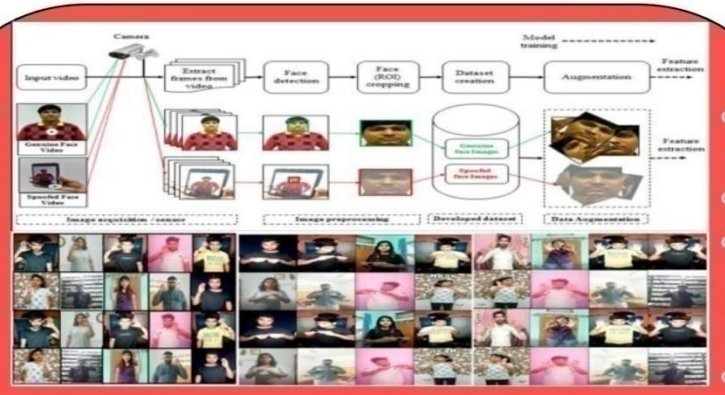
Singh, Dushyant Kumar, and Dharmender Singh Kushwaha. "Automatic Intruder Combat System: A way to Smart Border Surveillance." *Defence Science Journal* 67.1 (2017).

Suspicious Activity Modelling

Shoplifting Monitoring

Ansari, Mohd, and Dushyant Kumar Singh. "An expert video surveillance system to identify and mitigate shoplifting in megastores", *Multimedia Tools and Applications* (2021): 1-29.

Identity Threat Handling



Sign Language Modelling

Rusia, Mayank Kumar, and Dushyant Kumar Singh. "Deep Architecture Based Face Spoofing Identification in Real-Time Application." *International Journal of Biometrics* 14.1 (2021): 61-82.

Design of Real-time and Intelligent Cyber Physical Systems with Vision, IoT and HCI orientation

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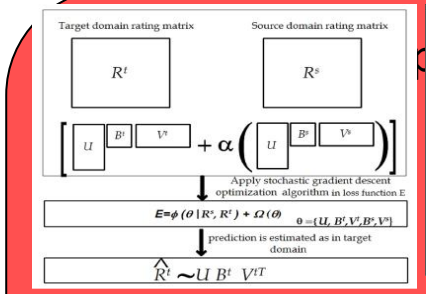
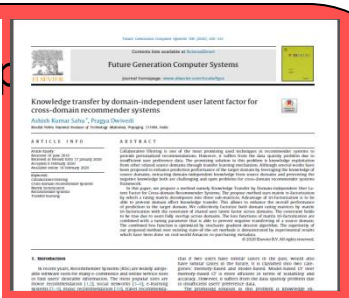
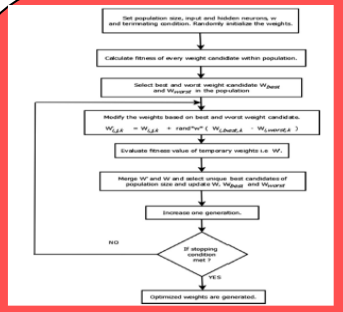
- **Data Science : Recommender System**
- **Machine Learning : Electricity Load Forecasting**

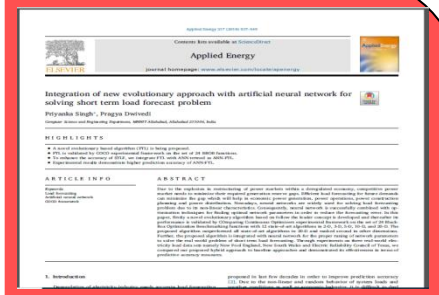
Social Computing: E-Learning



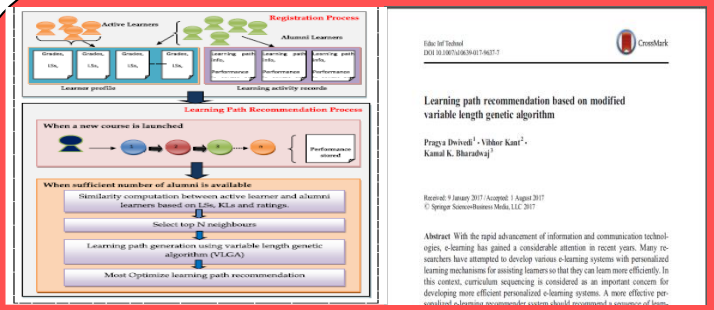


Proposed Hybrid Approach (ANN-FTL) for Solving Short Term Load Forecasting Problem
idoi.org/10.1016/j.apenergy.2018.02.131





Proposed a Novel Method Namely Knowledge Transfer by Domain-independent User Latent Factor for Cross-domain Recommender Systems
https://doi.org/10.1016/j.future.2020.02.024



Proposed a Learning Path Sequence for E-Learner
https://doi.org/10.1007/s10639-017-9637-7

Machine Learning Techniques in Recommender Systems, E-learning, Electricity Load Forecasting, Social Network ,

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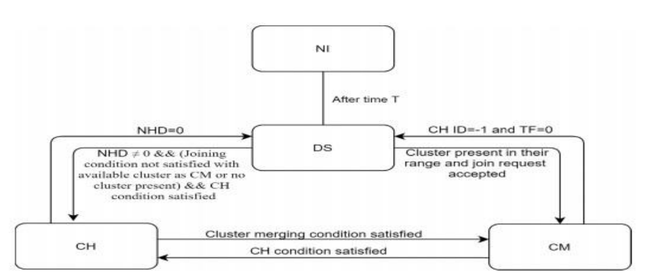
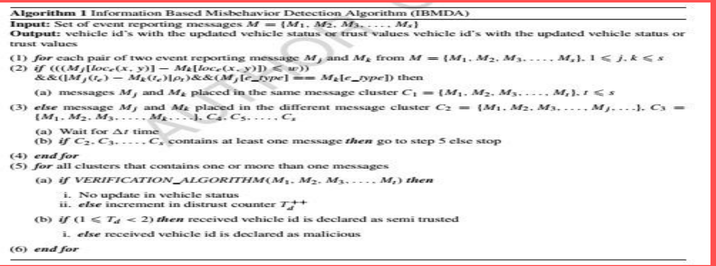
- **Vehicular Ad-hoc Network**
- **Edge Computing**
- **Data Mining and Machine Learning**



Cluster State transition in Advanced Multi-hop clustering algorithm for Vehiculau ad-hoc Network

Katiyar, A., Singh, D., & Yadav, R. S. (2022). Advanced multi-hop clustering (AMC) in vehicular ad-hoc network. *Wireless Networks*, *28*(1), 45-68.



Algorithm 1 Information Based Misbehavior Detection Algorithm (IBMDA)

Input: Set of event reporting messages $M = \{M_1, M_2, M_3, \ldots, M_s\}$

Output: vehicle id's with the updated vehicle status or trust values vehicle id's with the updated vehicle status or trust values

(1) *for* each pair of two event reporting message M_j and M_k from $M = \{M_1, M_2, M_3, \ldots, M_s\}$, $1 \leqslant j, k \leqslant s$

(2) *if* $(((M_j[loc_e(x, y)] - M_k[loc_e(x, y)]) \leqslant w))$ $\&\&(|M_j(t_e) - M_k(t_e)|\rho_t)\&\&(M_j[e\_type] == M_k[e\_type])$ then

 (a) messages M_j and M_k placed in the same message cluster $C_1 = \{M_1, M_2, M_3, \ldots, M_t\}$, $t \leqslant s$

(3) *else* message M_j and M_k placed in the different message cluster $C_2 = \{M_1, M_2, M_3, \ldots, M_j, \ldots\}$, $C_3 = \{M_1, M_2, M_3, \ldots, M_k, \ldots\}$, $C_4, C_5, \ldots, C_s$

 (a) Wait for Δt time

 (b) *if* $C_2, C_3, \ldots, C_s$ contains at least one message ***then*** go to step 5 else stop

(4) ***end for***

(5) *for* all clusters that contains one or more than one messages

 (a) *if VERIFICATION_ALGORITHM*$(M_1, M_2, M_3, \ldots, M_t)$ ***then***

  i. No update in vehicle status

  ii. *else* increment in distrust counter T_d^{++}

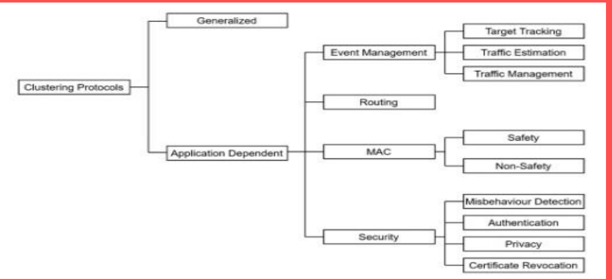
 (b) *if* $(1 \leqslant T_d < 2)$ ***then*** received vehicle id is declared as semi trusted

  i. *else* received vehicle id is declared as malicious

(6) ***end for***

Proposed Information based Misbehavior Detection Algorithm for VANET

Singh, D., & Yadav, R. S. (2020). IBMDA: Information based misbehavior detection algorithm for VANET. *Journal of High Speed Networks*, *26*(3), 185-207.



Taxonomy of Clustering Protocol in VANET

Katiyar, A., Singh, D., & Yadav, R. S. (2020). State-of-the-art approach to clustering protocols in VANET: a survey. *Wireless Networks*, *26*(7), 5307-5336.

Vehicular Ad-hoc Network, Smart Transportation System, Edge Computing, Data Mining and Machine Learning

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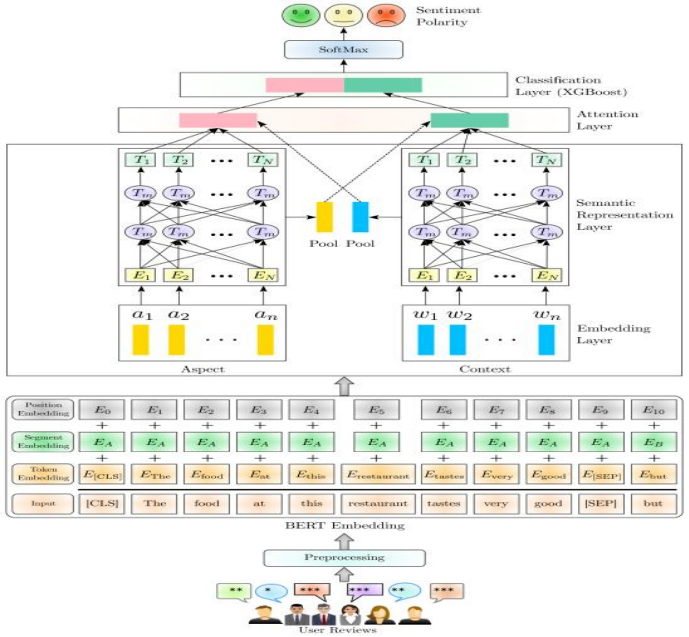
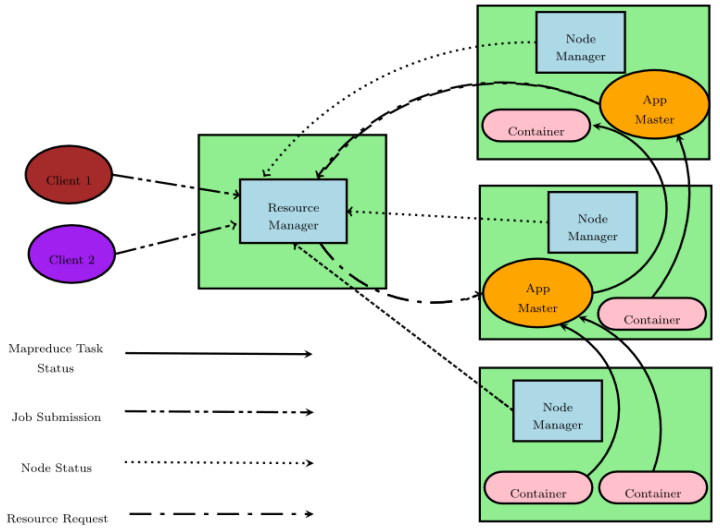
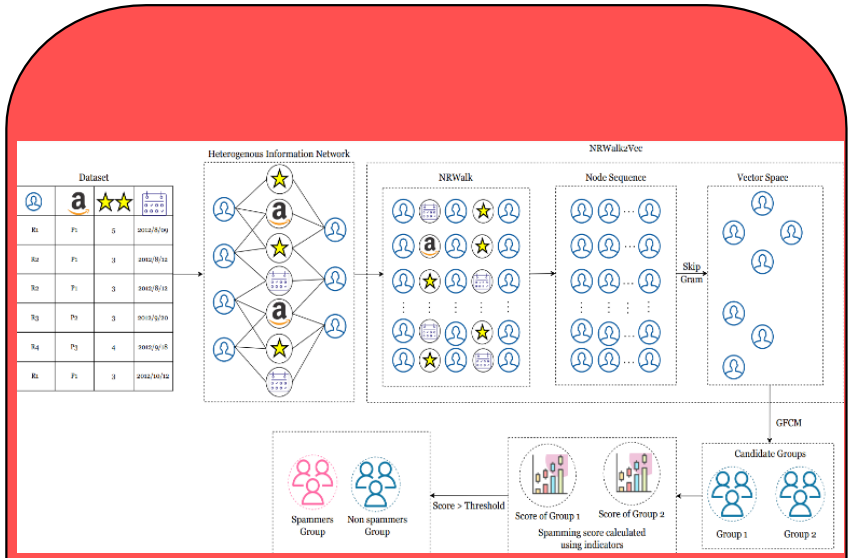
Machine Learning, Data Mining, BigData, Data Science, and Cyber/Information Security, IOT, Algorithms, Computer Vision, Artificial Intelligence.



(Springer) The Journal of Supercomputing
https://doi.org/10.1007/s11227-022-04881-x)



(Springer) Applied Intelligence
https://doi.org/10.1007/s10489-022-03837-1



(Springer) The Journal of Supercomputing
https://doi.org/10.1007/s11227-022-04882-x)

Approach to mitigate stragglers in heterogeneous Hadoop cluster and Review Spam Detection Methods

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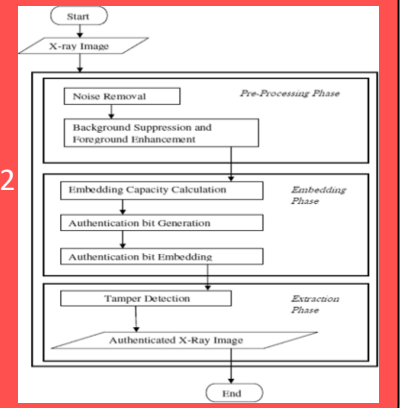
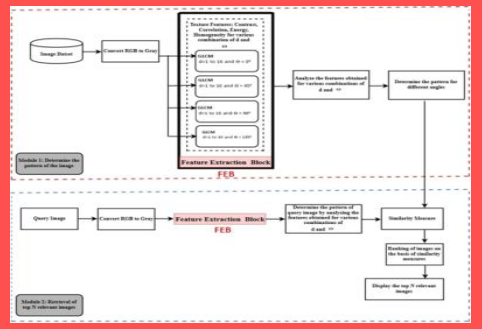
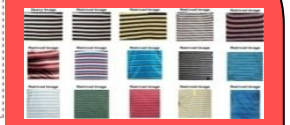
- **Image Processing**
- **Computer Vision**
- **Deep Learning**



Self Authenticating Medical X-ray Images for Telemedicine Applications, can be found at: https://doi.org/10.1007/s11042-017-4738-2





Pattern-Based Image Retrieval using GLCM, Can be found at https://doi.org/10.1007/s00521-018-3611-1

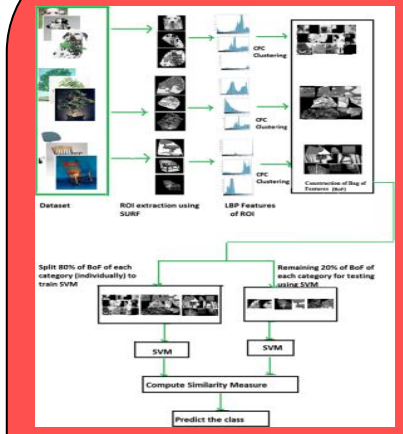


Image Classification using SURF and bag of LBP Features constructed by Clustering with Fixed Centers, Can be found at : https://doi.org/10.1007/s11042-018-6793-8

Main focus of the Research is on the key areas related to Image, Vision, Medical Image Processing and Deep Learning

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Internet of Things (IoT) , Machine Learning, Wireless Sensor Network

Springer Link

Published: 14 February 2020

A multi-tier based clustering framework for scalable and energy efficient WSN-assisted IoT network

Anurag Shukla & Sarsij Tripathi

Wireless Networks **26**, 3471–3493 (2020) | Cite this article

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Building an efficient intrusion detection system using grasshopper optimization algorithm for anomaly detection

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Cluster Computing **24**, 1881–1900 (2021) | Cite this article

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BERT-Based Transfer-Learning Approach for Nested Named-Entity Recognition Using Joint Labeling

by Ankit Agrawal [1], Sarsij Tripathi [2], Manu Vardhan [1], Vikas Sihag [3], Gaurav Choudhary [4] and Nicola Dragoni [4,*]

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[4] DTU Compute, Department of Applied Mathematics and Computer Science, Technical University of Denmark (DTU), 2800 Kongens Lyngby, Denmark
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Academic Editors: Arturo Montejo-Ráez and Salud María Jiménez-Zafra

Appl. Sci. **2022**, *12*(3), 976; https://doi.org/10.3390/app12030976

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BROAD DESCRIPTION OF THE BANDWIDTH/AREA OF RESEARCH

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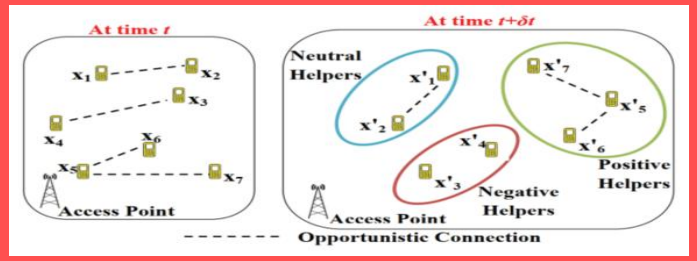
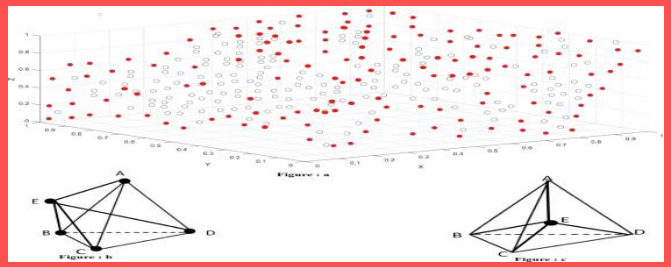
- **Internet of Things**
- **Network Security**
- **Artificial Intelligence enabled Networking**

Energy efficient boundary detection algorithm for monitoring systems is proposed.

(**Elsevier**) Journal of Parallel and Distributed Computing
DOI: https://doi.org/10.1016/j.jpdc.2017.06.002



A heuristics-based optimal Target Set Selection (TSS) algorithm is proposed for opportunistic data offloading
(**Springer**) *Mobile Networks and Applications*
DOI: *https://doi.org/10.1007/s11036-021-01760-2*



Presented a practical, distributed, and energy-efficient algorithm for reliable 3*D C-N* detection.
(**Springer**) *Wireless Networks*
https://doi.org/10.1007/s12652-022-03733-z

Artificial Intelligence enabled Algorithms for WSN, IoT, DTN, Cyber-Physical System(CPS) and Telemedicine

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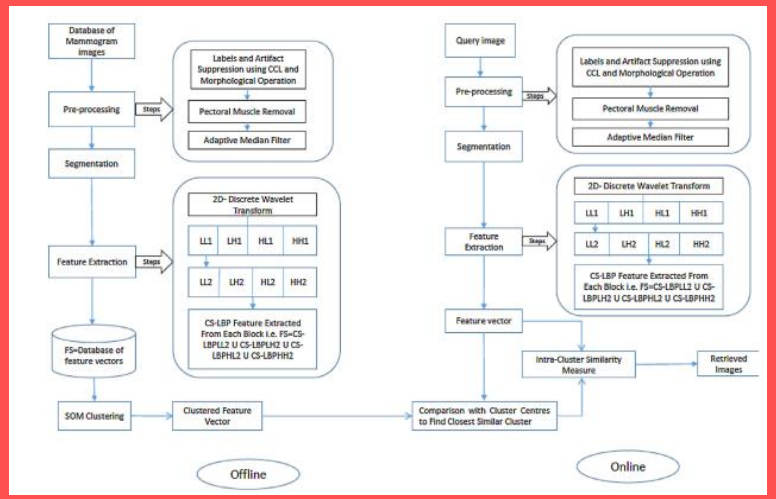
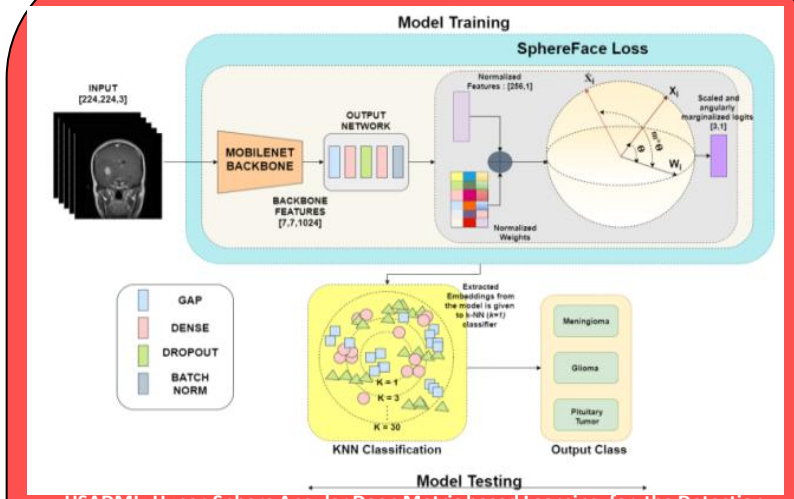
- **Image Processing and Computer Vision**
- **Medical Image Analysis**
- **Machine Learning**



Automated and Effective Content-Based Image Retrieval System Using Wavelet based CS-LBP Feature and Self-organizing map, Published - Biocybernetics and Biomedical Engineering, 38 (2018), 90-105, Elsevier.



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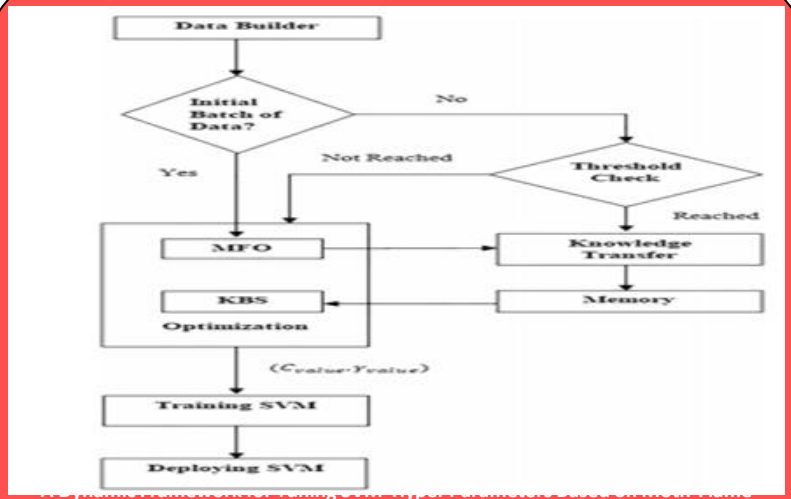

Optimization and Knowledge-based-search, Published- Expert Systems With Applications 168 (2021) 114139, Elsevier.

Artificial Intelligence in Image Processing and Computer Vision Applications

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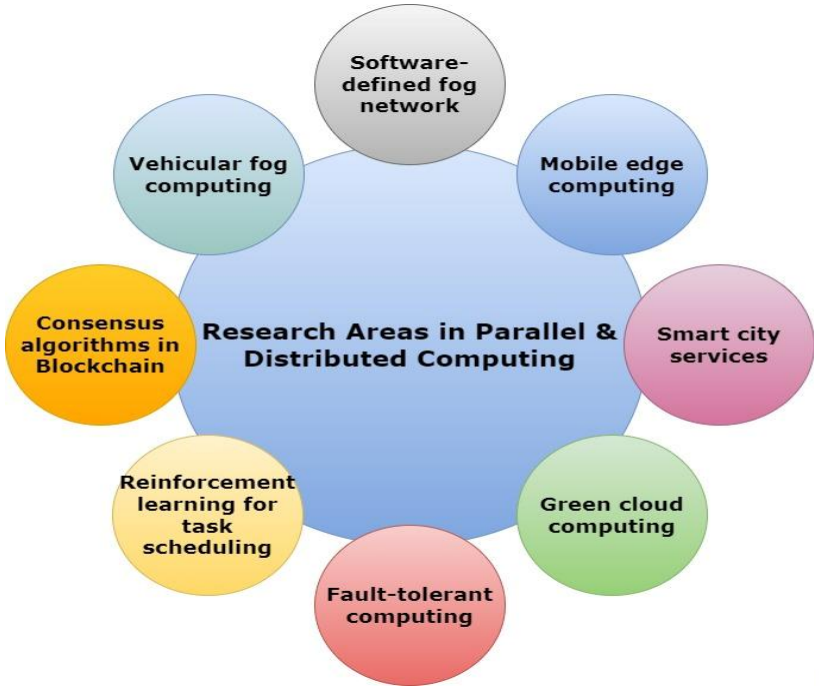
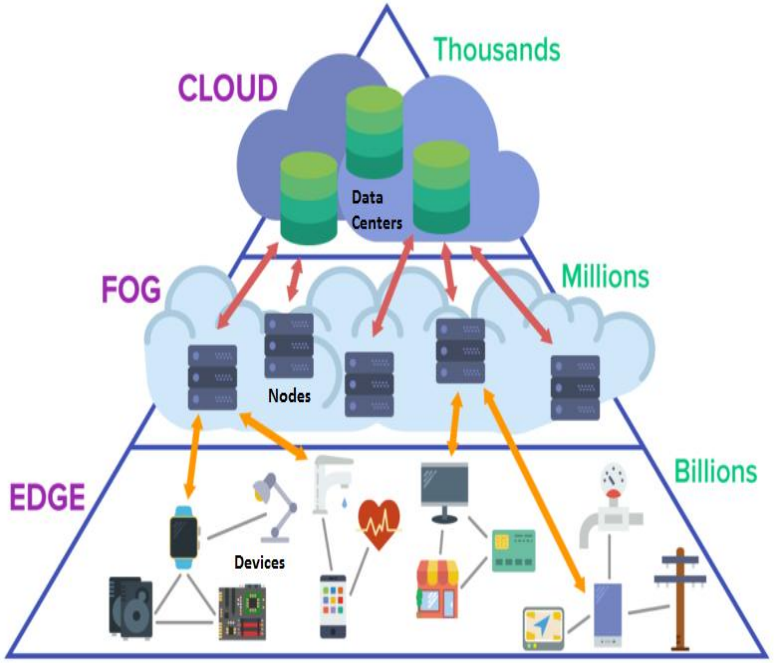
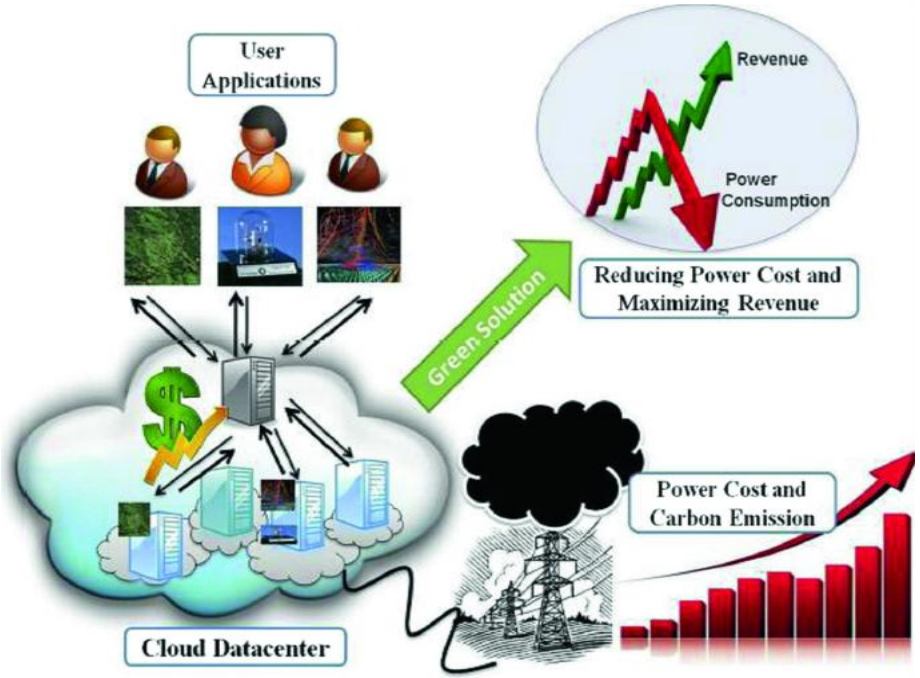
- **Parallel & Distributed Computing**
- **Cloud, Fog and Edge Computing**
- **Energy-aware Workflow Scheduling**







BROAD DESCRIPTION OF THE AREA OF RESEARCH

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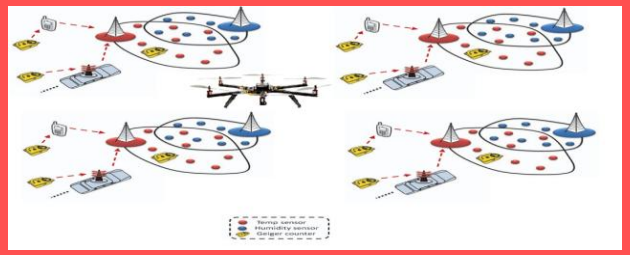
- **Internet of Things & UAV Simulations**
- **Blockchain Technology**
- **Machine Learning**



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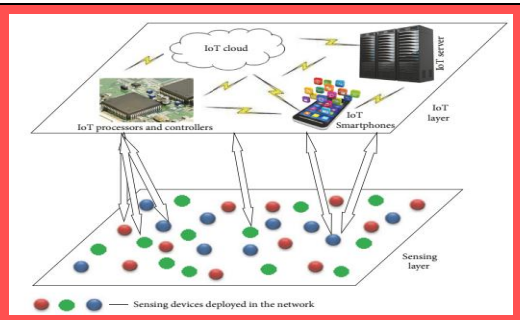

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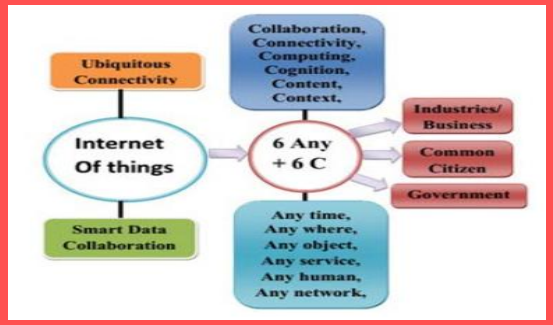

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Internet of Things (IoT) and UAV Simulations in post disaster management, Networking and ML

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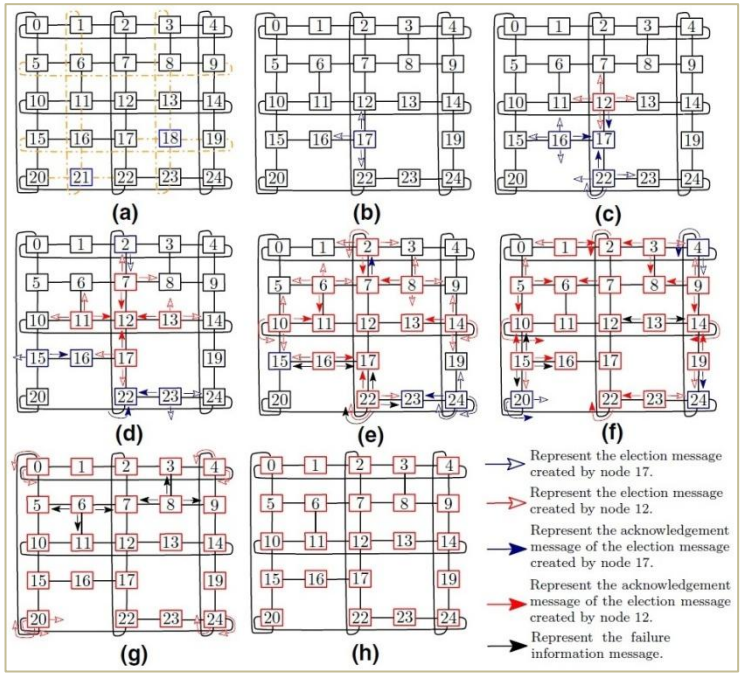
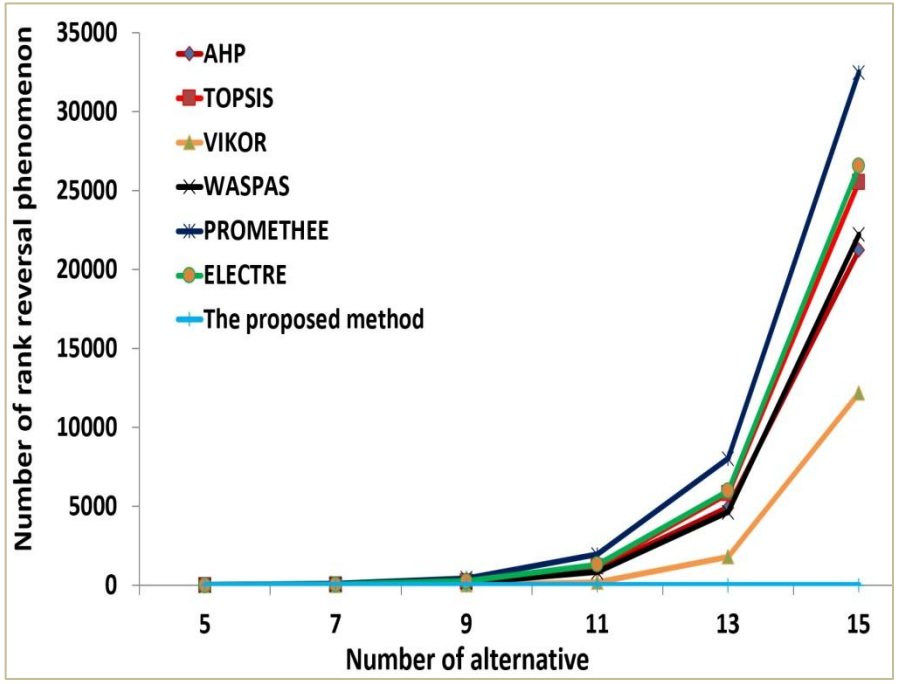
- **Distributed Systems**
- **Blockchain**
- **Multi-criteria Decision Making**

Lea-TN: A leader election algorithm



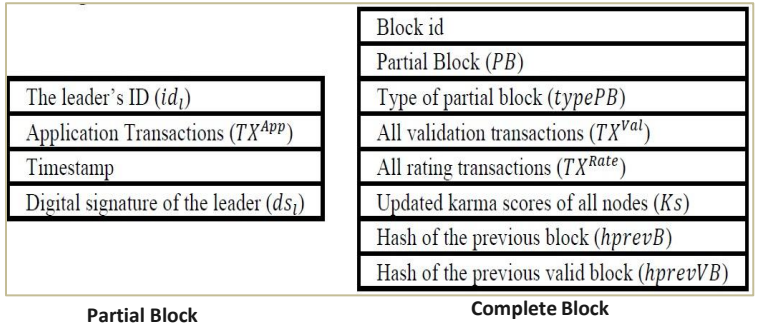
Published in ***Journal of Supercomputing***

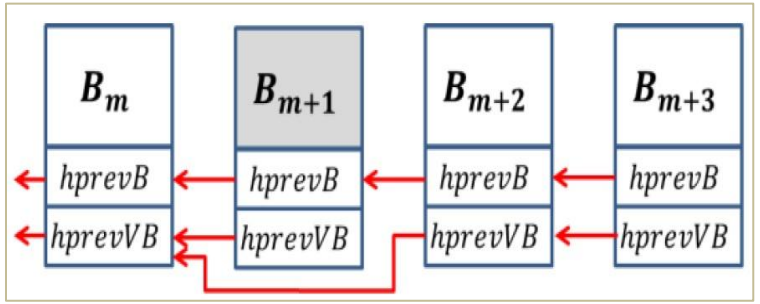
ABAC: A rank reversal free MCDM method



Published in ***Expert Systems with Applications***

Blockchain framework (Proof of Karma)





Published in ***IEEE Transactions on Services Computing***

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Research Area

- **Power Electronics and Control**
- **Renewable Energy Power Conversion**
- **Energy Storage and Grid Integration**
- **Digital Controllers for Converters**

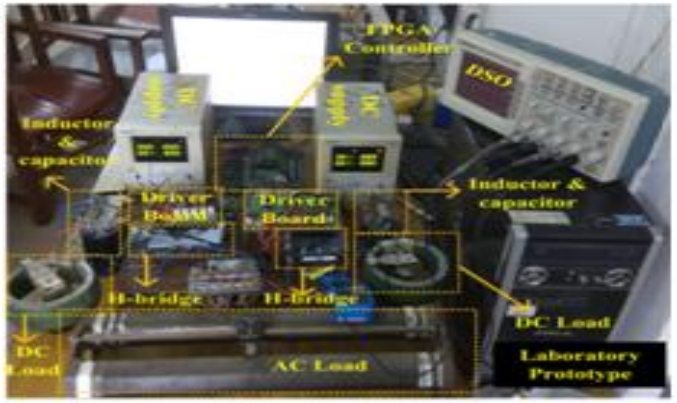
Alok Agrawal and Rajesh Gupta, Coordinated Control of Hybrid DERs Enabled Grid-Interactive Residential PCM with Hybrid Bus Layout, ***IEEE Systems Journal***, Jan. 2022.

P. C. D. Goud and Rajesh Gupta, Modular Multi-output Hybrid Converter for Residential Hybrid Loads, ***IEEE Journal of Emerging and Selected Topics in Power Electronics***, Nov., 2021.

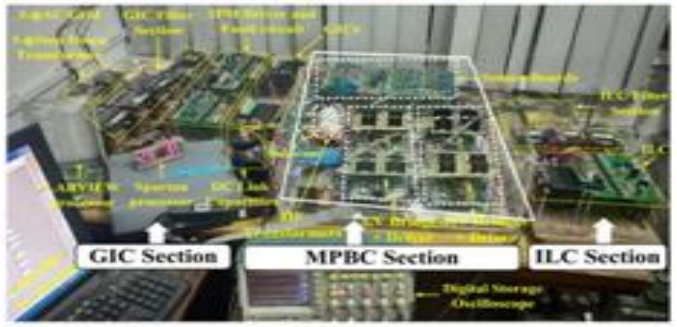
Chandra Sekhar Nalamati, Alok Agrawal and Rajesh Gupta, Multiple parallel-connected DAB-based Solid State Transformer for Hybrid DC/AC Microgrid System, ***IET Generation, Transmission and Distribution***, Dec.2020.

Modular Hybrid DC-DC/AC Converter →

Wind-Solar Hybrid PCM



Parallel DAB based SST →



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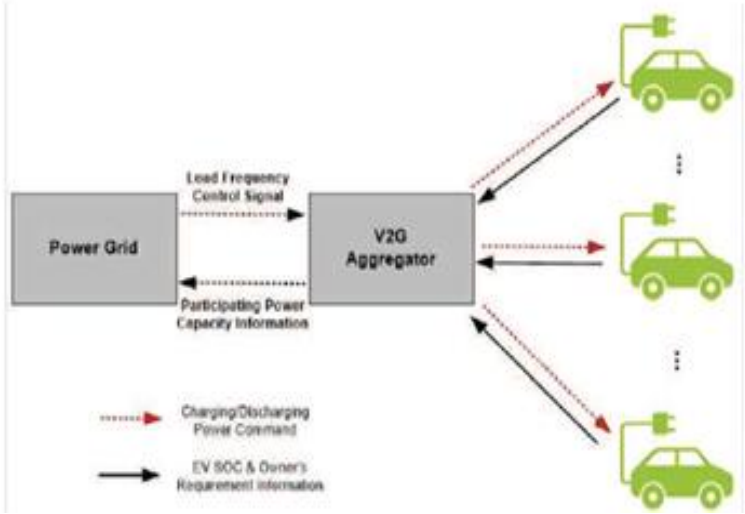
- **Artificial Intelligence Application in Power System**
- **Power System Planning**
- **Deregulated Energy Markets**
- **Electrical Vehicles Charging Strategies**

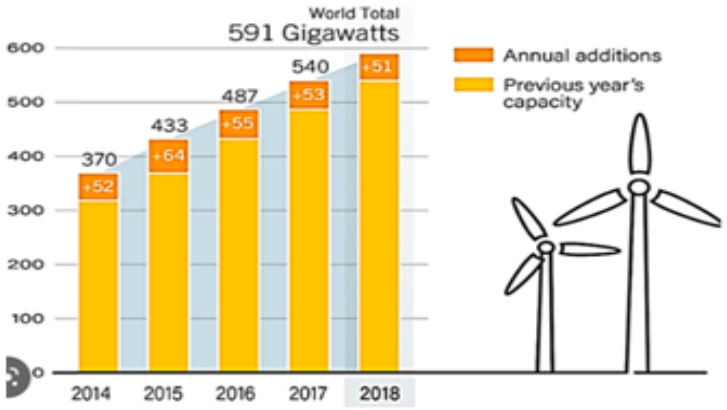
Plug-in Electric Vehicles Participation in Primary Frequency Control Considering Charging Demand

Dr. Nitin Singh



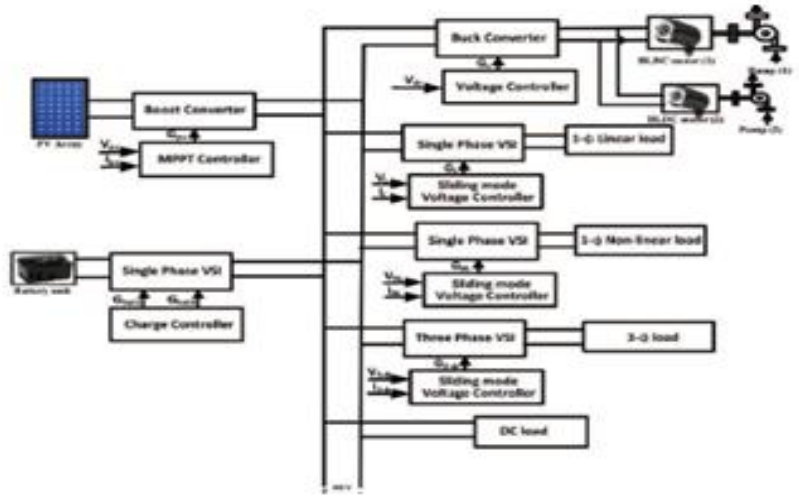
Short-Term Wind Power Prediction Using Hybrid Auto Regressive Integrated Moving Average Model and Dynamic Particle Swarm Optimization

Dr.Nitin Singh



Multipurpose water storage tank based DC micro grid System for isolated communities

Dr. Nitin Singh



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- **DC-DC Converters for fuel cell power sources**
- **Electric Vehicles, Power conditioning units for EVs, superfast charging systems, Solar PV Vehicles, FC Vehicles**
- **Grid Independent Electric Vehicle Driving Systems, Solar PV Reconfiguration**

BROAD DESCRIPTION OF THE BANDWIDTH/AREA OF RESEARCH

The fuel cells are clean and efficient power sources and has been gaining popularity through out the world . The fuel cell devices have low output voltage and hence suitable DC-DC converter is essential to interface the FC system with practical loads. Various isolated and non isolated power converters are under study and continuous research is going on this topic.

The electric vehicles are predominately entering the transportation market near about 5 million Evs have been sold through about the world as on 2021. The Evs are noise less and pollution free. Lots of research is conducted on the development of EV systems. The EV system need power electronic converters to integrate battery with the motor and also need for charging the batteries. The power conditioning systems for EV is an important area of research for a power electronics engineer. There is a much need of efforts in developing the efficient and economical DC-DC power converters, Inverters and Rectifiers for Evs. Further, The Ev systems need a charging systems with less time, for that one need to focus on superfast charging schemes. Grid independent Evs like solar and FC vehicles are most important and need much attention by the researchers. The solar PV reconfiguration is an most important area to make the system efficient.

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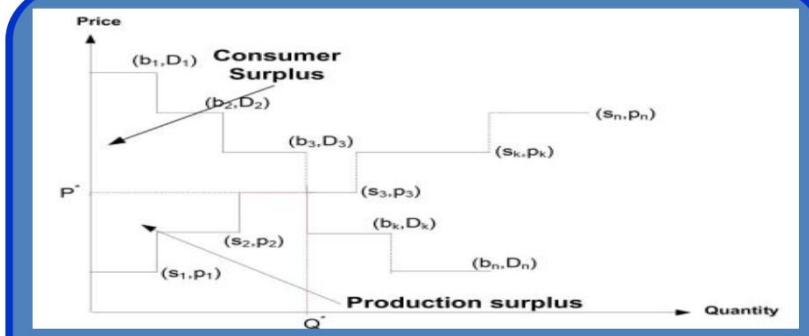
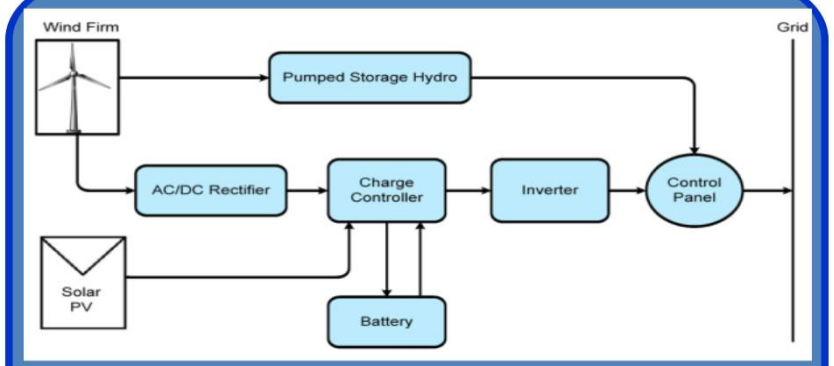
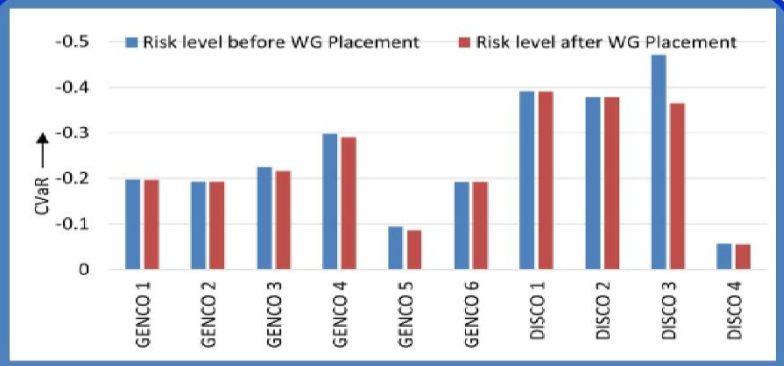
- Optimal Bidding in Deregulation Power Sector
- Renewable Energy Integration in Competitive Power Markets
- Risk Assessment and Mitigation in Competitive Power Markets



Optimal Bidding in Deregulation Power Sector



Renewable Energy Integration in Competitive Power Markets



Risk Assessment and Mitigation in Competitive Power Markets

Competitive Electricity Markets & Its Operation

Department of Electronics & Communication Engineering

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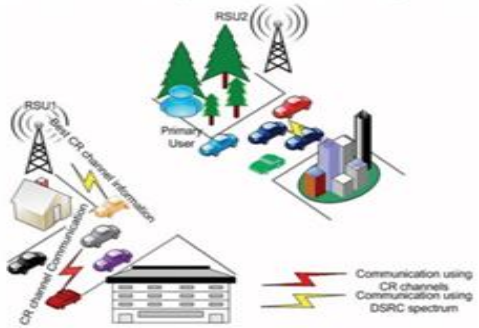
- **Wireless and Mobile Communication**
  - **Vehicular Communication**
  - **Cognitive Radio Networks**

Regional Super Cluster Based Optimum | Channel Selection for CR-VANET

Publisher: IEEE | Cite This | PDF

Raghavendra Pal ; Arun Prakash ; Rajeev Tripathi ; Kshirasagar Naik All Authors



Published in: IEEE Transactions on Cognitive Communications and Networking (Volume: 6 Issue: 2, June 2020)

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Date of Publication: 18 December 2019

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KeAi CHINESE ROOTS GLOBAL IMPACT

Digital Communications and Networks

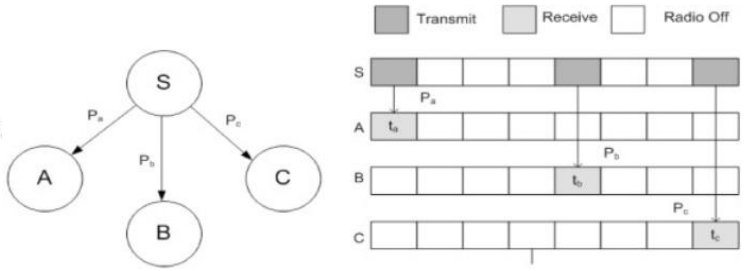
Available online 4 February 2022

In Press, Journal Pre-proof

A novel slot scheduling technique for duty-cycle based data transmission for wireless sensor network

Yogesh Tripathi, Arun Prakash, Rajeev Tripathi

https://doi.org/10.1016/j.dcan.2022.01.006



ELSEVIER

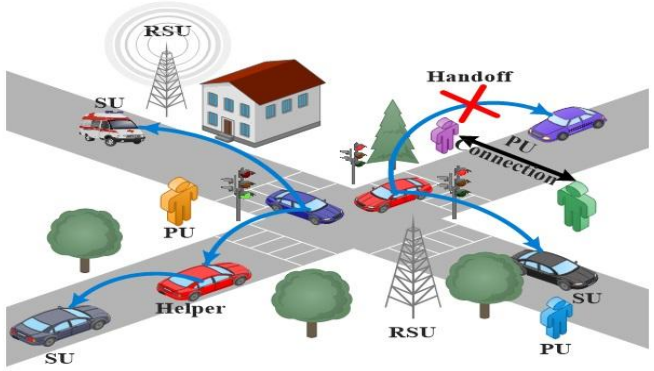
Vehicular Communications

Volume 29, June 2021, 100336

https://doi.org/10.1016/j.vehcom.2021.100336

A novel cooperative MAC protocol for safety applications in cognitive radio enabled vehicular ad-hoc networks

Jahnvi Tiwari, Arun Prakash, Rajeev Tripathi



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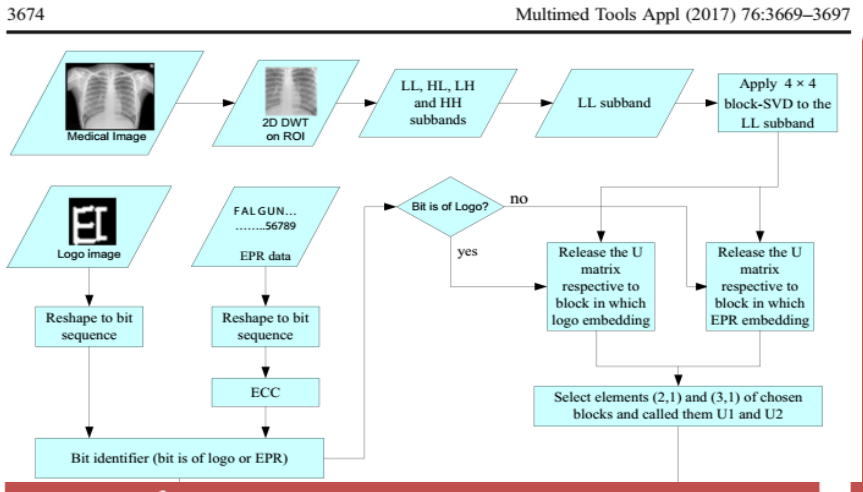
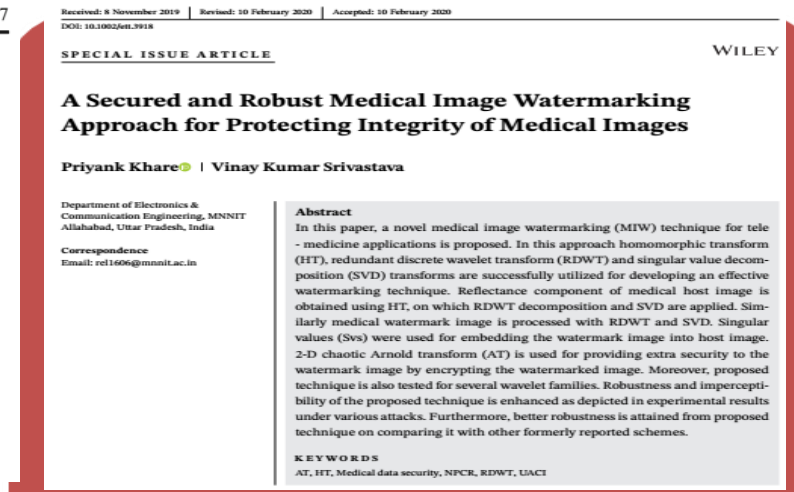
- **Image and Signal Processing, Communication Systems**
  - **Digital Image Watermarking**
- **DSP methods for the identification of protein coding regions in DNA sequences**





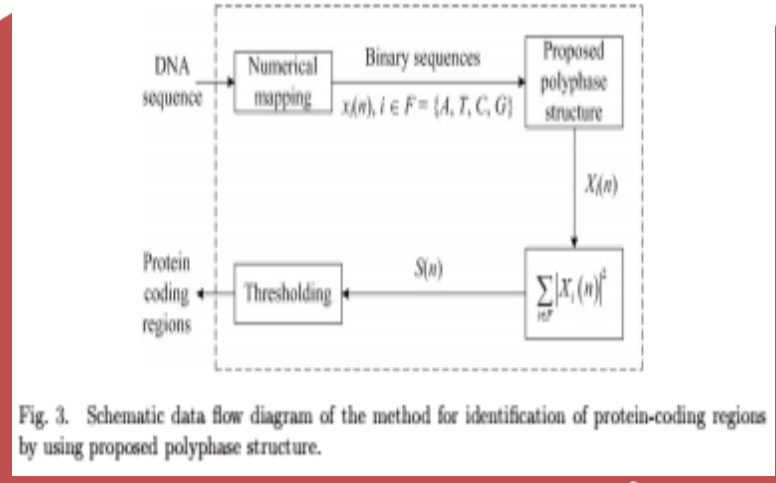


Fig. 3. Schematic data flow diagram of the method for identification of protein-coding regions by using proposed polyphase structure.

Transform domain techniques for image watermarking and detection of protein coding regions in DNA

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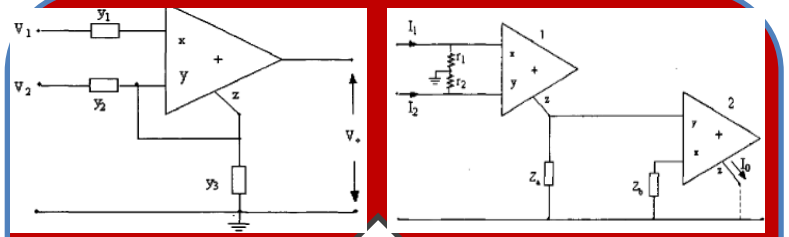
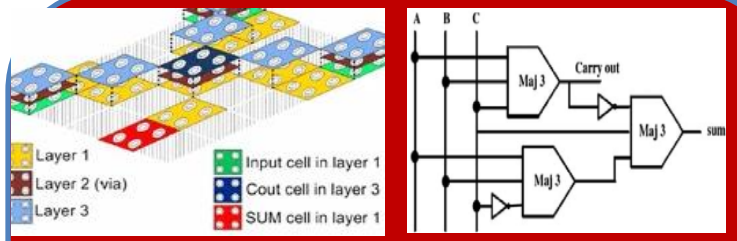
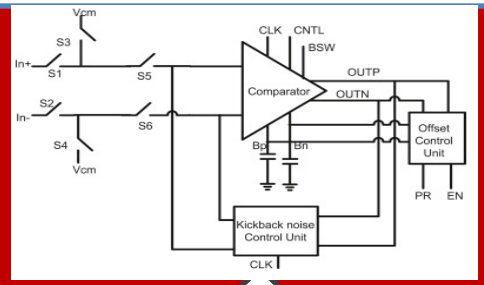
- **Mixed-mode/Analog signal processing**
- **VLSI Design and Applications**
- **High speed Programmable Analog Networks**



Current Feedback Amplifiers Published in Journal of Telecommunications



Quantum Dot Cellular Automata Published in Journal of Computational Electronics



Optimization for offset and kickback-noise in novel CMOS double-tail dynamic comparator Published in Microelectronics Journal

VLSI Circuit Design and Their application in Mixed-mode/Analog signal processing

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- Multidimensional Systems
- Digital Signal Processing
- Guaranteed Cost Control
- Robust Stability

Circuits Syst Signal Process (2018) 37:2934–2957
https://doi.org/10.1007/s00034-017-0698-z

ASIC Implementation of Area-Efficient, High-Throughput 2-D IIR Filter Using Distributed Arithmetic

Prashant Kumar[1] · Prabhat Chandra Shrivastava[1] · Manish Tiwari[1] · Amit Dhawan[1]

Received: 11 April 2017 / Revised: 20 October 2017 / Accepted: 23 October 2017 /
Published online: 7 November 2017

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Abstract This paper presents a generalized formulation of 2-D IIR filters using distributed arithmetic (DA) techniques. Based on the DA formulation, two efficient structures for 2-D IIR filters are proposed. Hardware-based look-up table (HLUT) is used in the internal blocks, so the proposed structures are reconfigurable. A novel approach of HLUT sharing, among the various internal blocks of structure, is used to reduce the requirement of adders and memory elements. For higher-order 2-D IIR filter, the complexity of HLUT is reduced by dividing the internal block of 2-D IIR filter into parallel and small block for DA decomposition. Such decomposition for higher-order 2-D IIR filters offers high degree of modularity, parallelism and regularity in building blocks, thereby achieving easier hardware and software implementation. In order to reduce combinational delay in the critical path, pipelining is used in the structures. Since proposed structures are multiplier-less and require lesser number of delays and adders, a significant improvement in chip area, power consumption and throughput can be obtained. Finally with the help of ASIC synthesis results, a comparative analysis is made and the results show that for the filter order 15, the proposed structures offer 69 and 59% reduction in ADP and 79 and 76% reduction in ADP than the earlier reported results for separable and non-separable structures, respectively.

Artide

An LMI approach to non-fragile robust optimal guaranteed cost control of uncertain 2-D discrete systems with both state and input delays

Transactions of the Institute of Measurement and Control
2018, Vol. 40(3) 785–804

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DOI: 10.1177/0142331216667476
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Akshata Tandon and Amit Dhawan

Abstract

In this paper, we present a solution to the problem of non-fragile robust optimal guaranteed cost control for a class of uncertain two-dimensional (2-D) discrete systems described by the general model (GM) subject to both state and input delays. The parameter uncertainties are assumed norm-bounded. A linear matrix inequality (LMI)-based sufficient condition for the existence of non-fragile robust guaranteed cost controller is established. Furthermore, a convex optimization problem with LMI constraints is proposed to select a non-fragile robust optimal guaranteed cost controller stabilizing the uncertain 2-D discrete system with both state and input delays as well as achieving the least guaranteed cost for the resulting closed-loop system. The effectiveness of the proposed method is demonstrated with an illustrative example.

Keywords

2-D discrete systems, guaranteed cost control, linear matrix inequality, Lyapunov methods, robust stability, state-delayed systems, uncertain systems

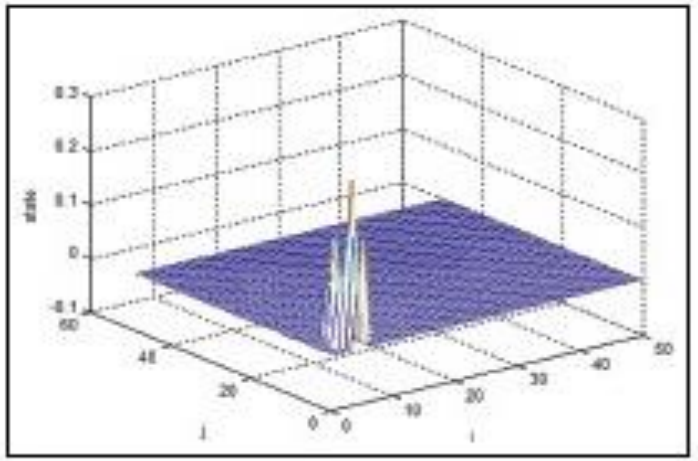

Figure 2. State response of the closed-loop system.

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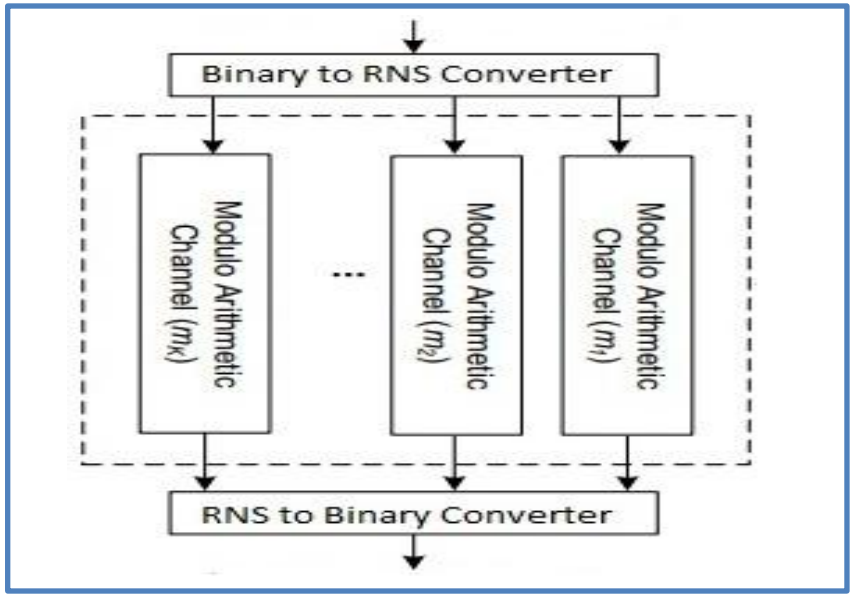
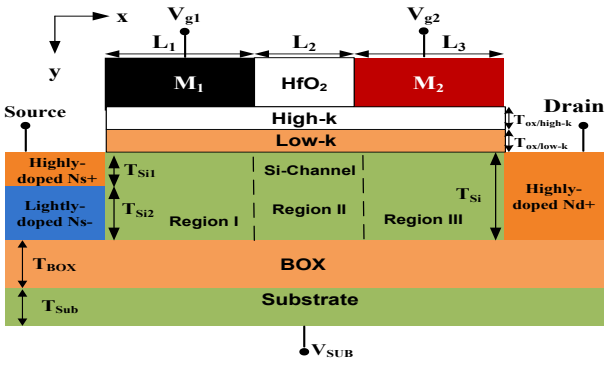
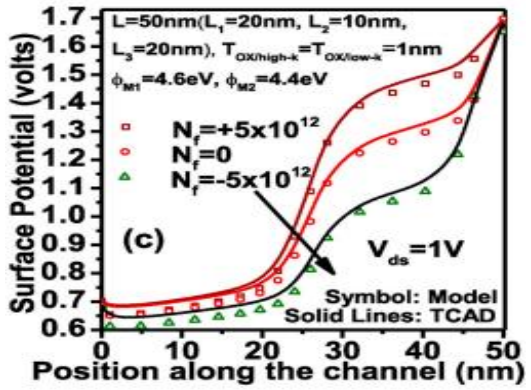
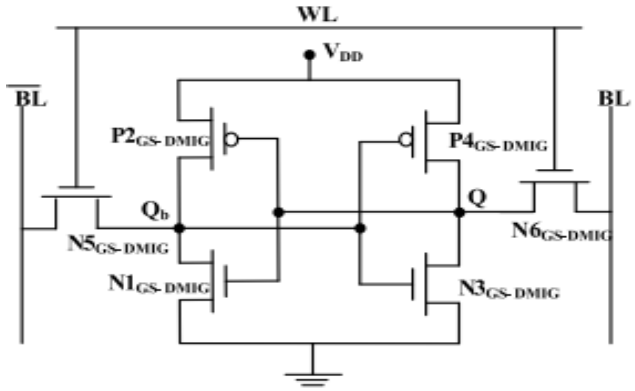
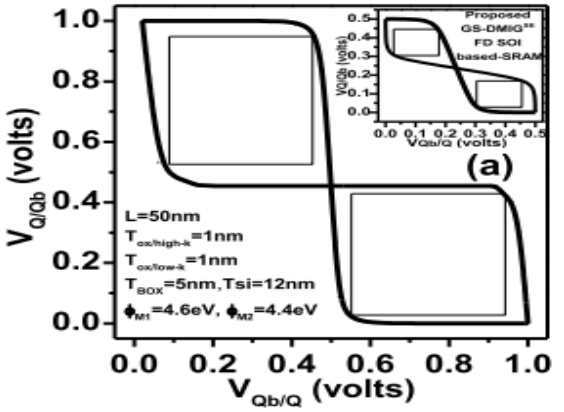
- ***Analysis, Modeling, and Applications of Semiconductor Devices***
- ***Digital VLSI Design***
- ***Low Power VLSI Circuits***
- ***Residue Number System based Circuits Design***











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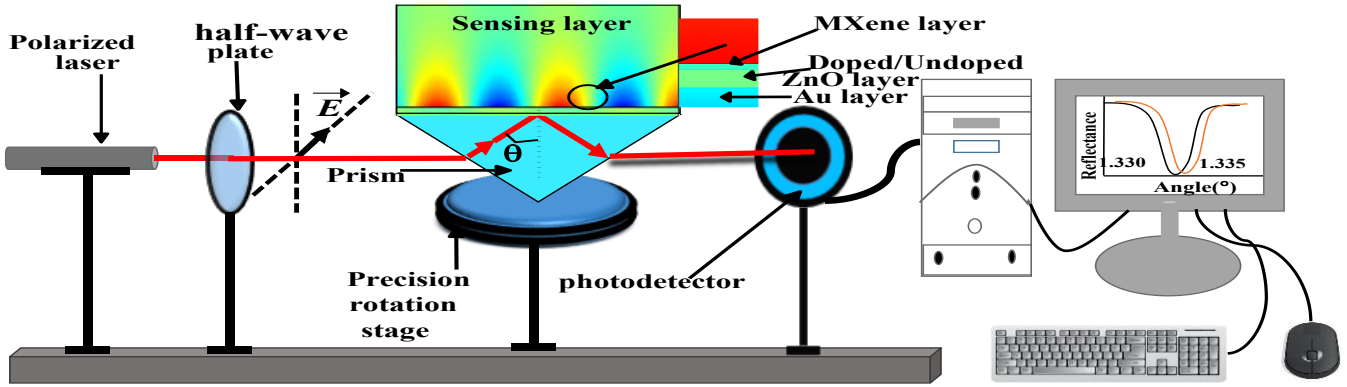
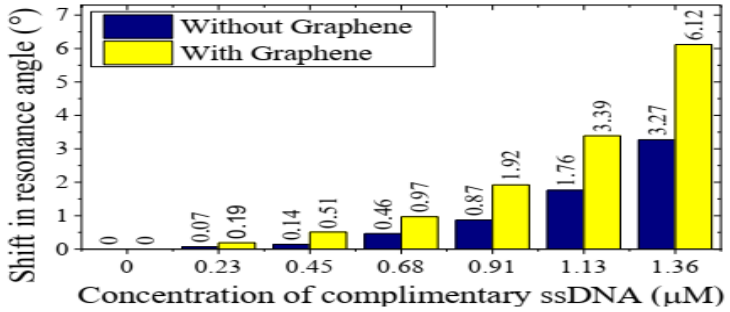
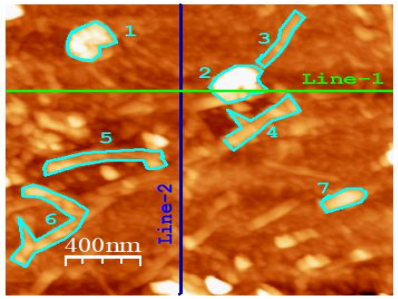
- **Optical Sensor and Communication**
- **Photonic Spin Hall Effect-based Sensors**



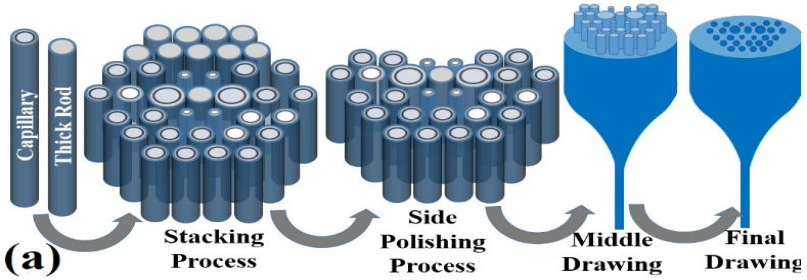
Experimental setup for proposed biosensor

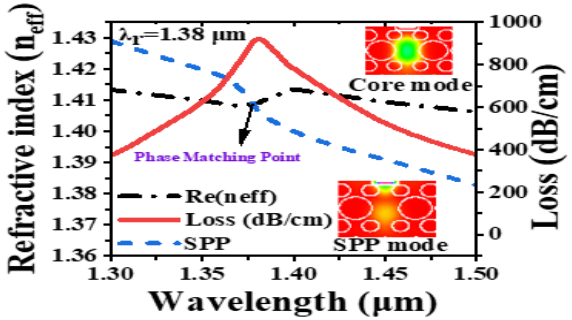
[Prajapati *et al.*, IEEE Sensors Journal, 10.1109/JSEN.2022.3154099, **2022**]



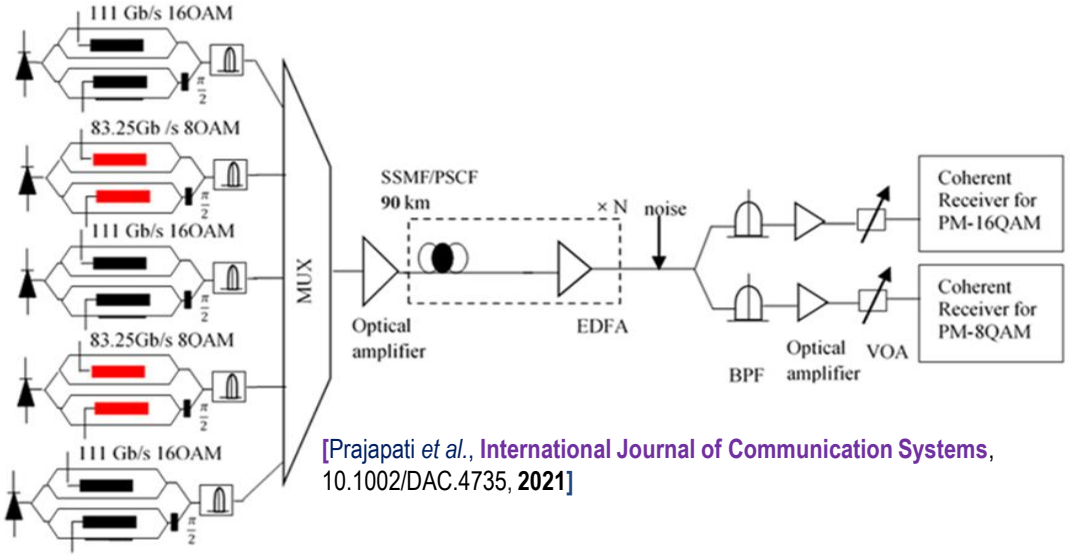


[Prajapati *et al.*, IEEE Journal of Lightwave Technology, 38 (18), pp. 5191-5198, **2020**]





[Prajapati *et al.*, IEEE Sensors Journal, 10.1109/JSEN.2022.3181198, **2022**]



[Prajapati *et al.*, International Journal of Communication Systems, 10.1002/DAC.4735, **2021**]

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- **Multidimensional Systems and Signal Processing**
- **Digital Filter Structure Design and Realization**
- **Embedded Systems**

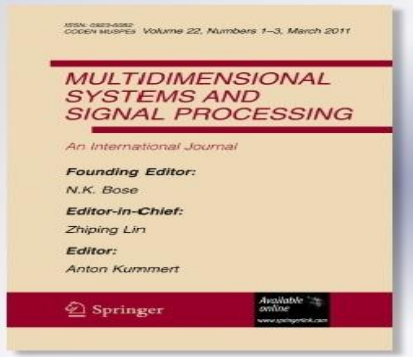
Comment on "Robust guaranteed cost control for a class of two-dimensional discrete systems with shift-delays"

Manish Tiwari & Amit Dhawan

Multidimensional Systems and Signal Processing
An International Journal

ISSN 0923-6082
Volume 23
Number 3

Multidim Syst Sign Process (2012)
23:415-419
DOI 10.1007/s11045-011-0151-6



Springer

ASIC Implementation of Area-Efficient, High-Throughput 2-D IIR Filter Using Distributed Arithmetic

Prashant Kumar, Prabhat Chandra Shrivastava, Manish Tiwari & Amit Dhawan

Circuits, Systems, and Signal Processing

ISSN 0278-081X

Circuits Syst Signal Process
DOI 10.1007/s00034-017-0698-z

Springer

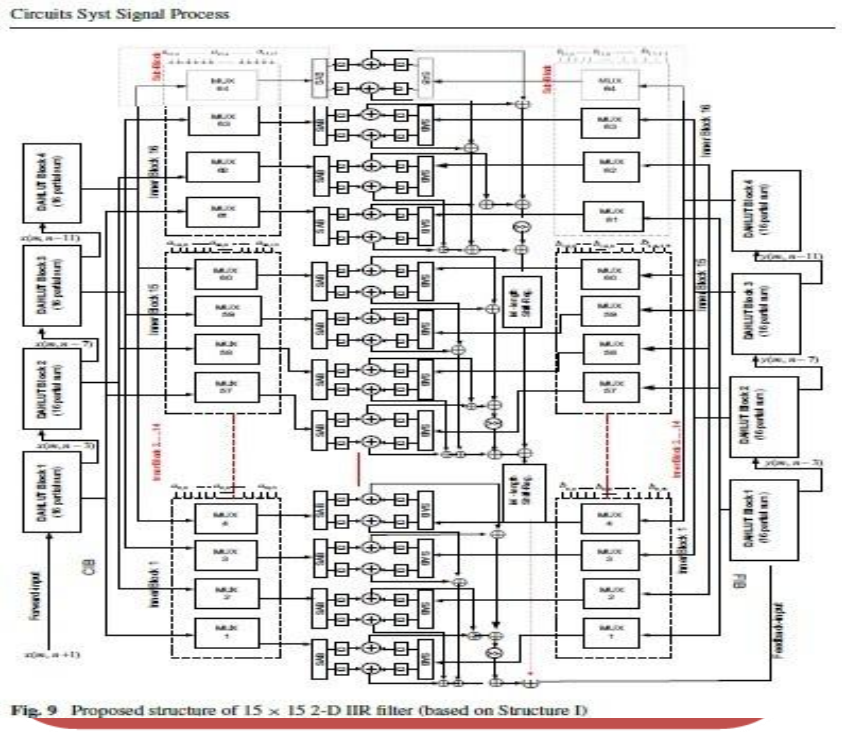


Fig. 9 Proposed structure of 15 × 15 2-D IIR filter (based on Structure I)

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- **Vehicular Communication and Networks**
- **Resource Allocation in Cognitive Radio Networks**
- **Adhoc Networks**

ELSEVIER

Ad Hoc Networks

Volume 108, 1 November 2020, 102285

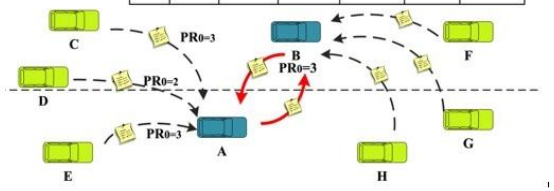
https://doi.org/10.1016/j.adhoc.2020.102285

Fuzzy-based beaconless probabilistic broadcasting for information dissemination in urban VANET

Ankita Srivastava, Arun Prakash, Rajeev Tripathi

Node table at A

Let for Vehicle A Distance= LESS Direction=TOWARDS Angular Orientation=SMALL	Source ID	Packet ID	Counter	Priority PR0	Packet Reception Time tR	Waiting time μs (Wt)	Broadcast time (BT)
	C	1	0	3	2	0.28	2.28
	D	2	0	2	2.1	0.28	2.38
	E	3	2	No further rebroadcasting			
	B	4	0	3	2.279	0	2.279



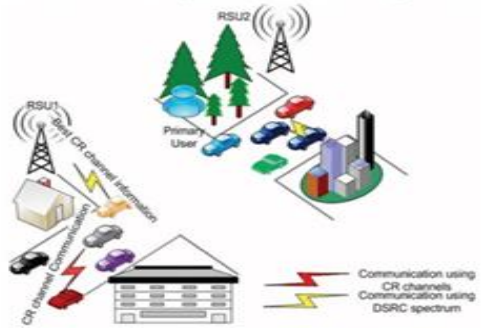
Regional Super Cluster Based Optimum Channel Selection for CR-VANET

Publisher: IEEE

Cite This

PDF

Raghavendra Pal ; Arun Prakash ; Rajeev Tripathi ; Kshirasagar Naik All Authors



Published in: IEEE Transactions on Cognitive Communications and Networking (Volume: 6 Issue: 2, June 2020)

Page(s): 607 - 617

INSPEC Accession Number: 19673106

Date of Publication: 18 December 2019

DOI: 10.1109/TCCN.2019.2960683

ELSEVIER

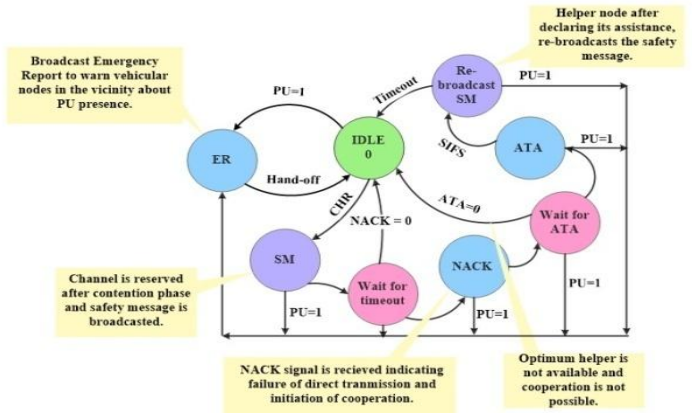
Vehicular Communications

Volume 29, June 2021, 100336

https://doi.org/10.1016/j.vehcom.2021.100336

A novel cooperative MAC protocol for safety applications in cognitive radio enabled vehicular ad-hoc networks

Jahnvi Tiwari, Arun Prakash, Rajeev Tripathi



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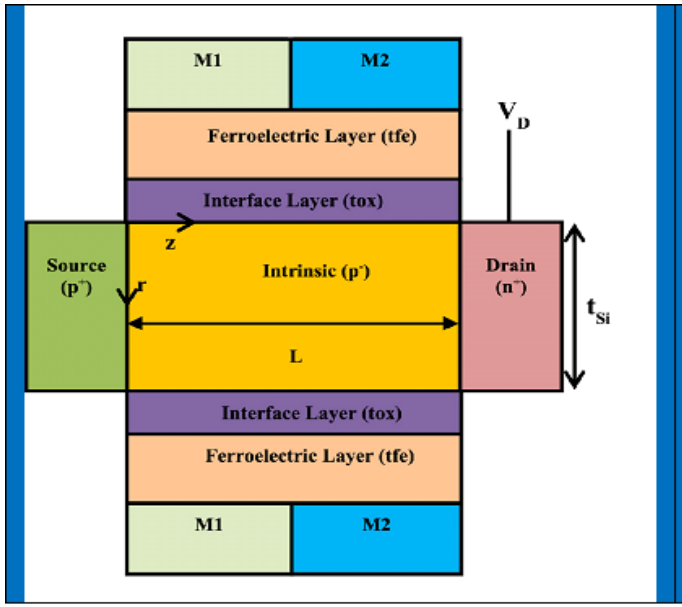
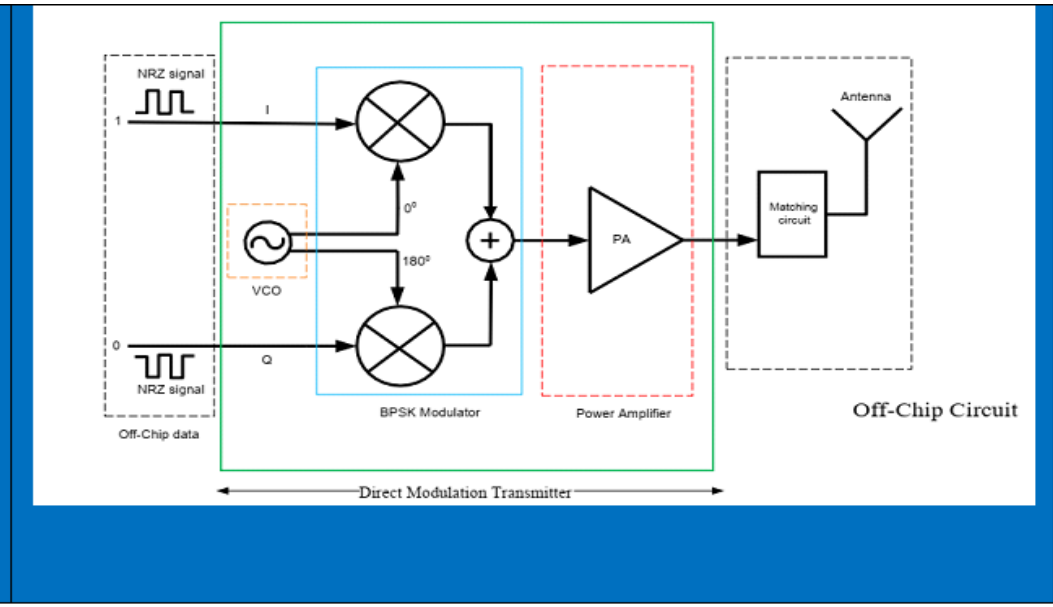
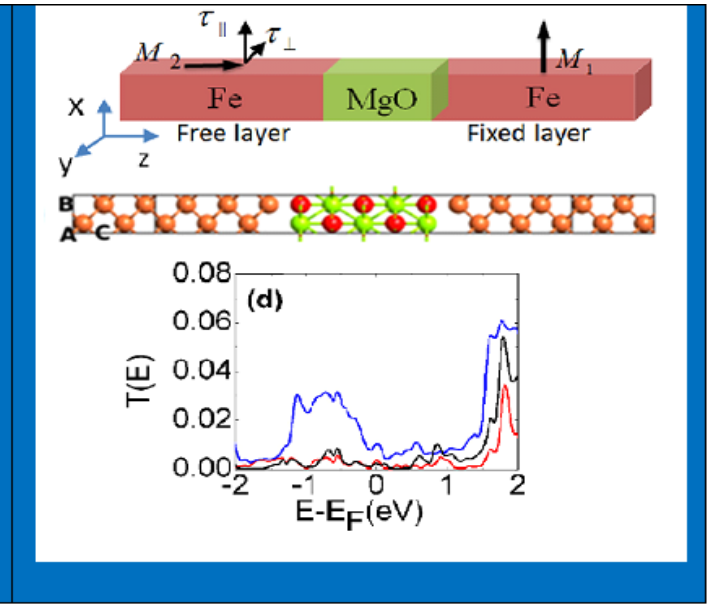
- **Simulation and Modeling of S/C Devices (MOSFETs, TFETs, FinFETs, etc.)**
- **VLSI Design (Analog/Digital/RF Circuits)**
- **Atomistic Simulation of Nano Transistors (MTJs, CNTs, etc.)**



S/C Device Modeling & Simulation



VLSI Design: Analog/Digital/RF Circuits



Atomistic Simulations: MTJ

Dr. Vinay Kumar

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Wireless Communication and Sensor Network, Brain Signal Processing

ELSEVIER

Biomedical Signal Processing and Control

Volume 74, April 2022, 103526

Machine-learning-enabled adaptive signal decomposition for a brain-computer interface using EEG

Ashwin Kamble (Member, IEEE) [a], Pradnya Ghare (Member, IEEE) [a], Vinay Kumar (Senior Member, IEEE) [b]

Journals & Magazines > IEEE Systems Journal > Volume: 14 Issue: 2

Cooperative Communication and Energy-Harvesting-Enabled Energy-Efficient Design of MI-Based Clustered Nonconventional WSNs

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Energy-Efficient Design of MI Communication-Based 3-D Non-Conventional WSNs

Publisher: IEEE | Cite This | PDF

Sadanand Yadav ; Vinay Kumar ; Sanjay B. Dhok ; Dushantha N. K. Jayakody All Authors

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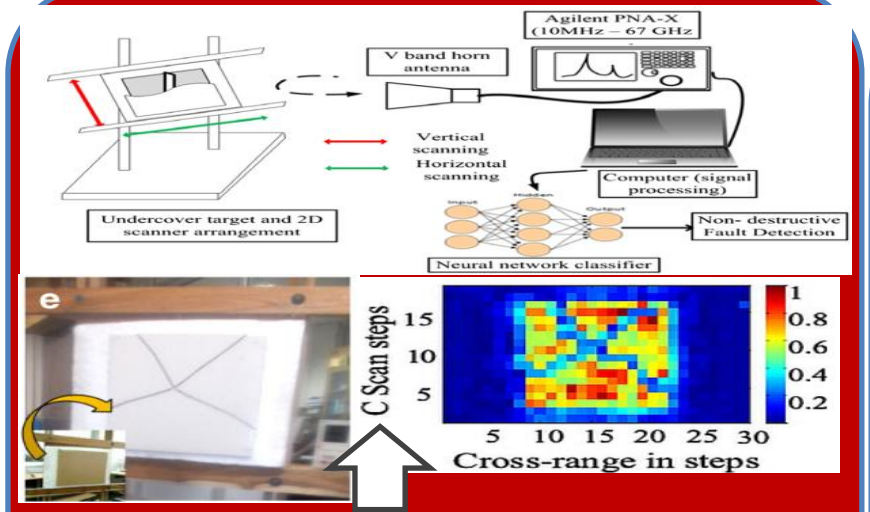
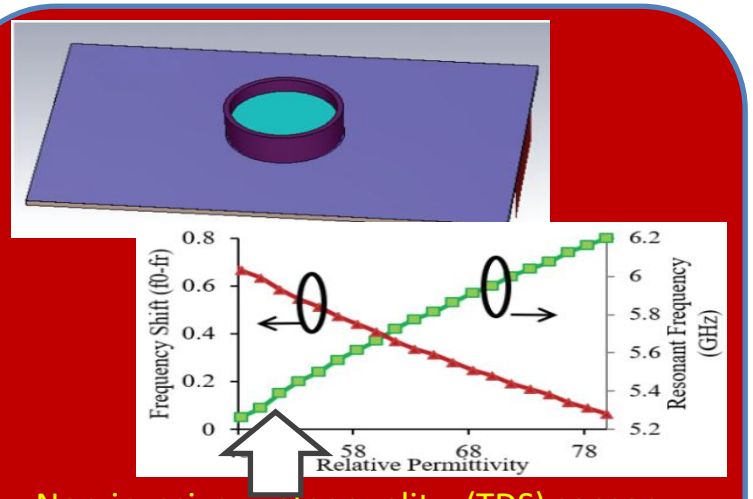
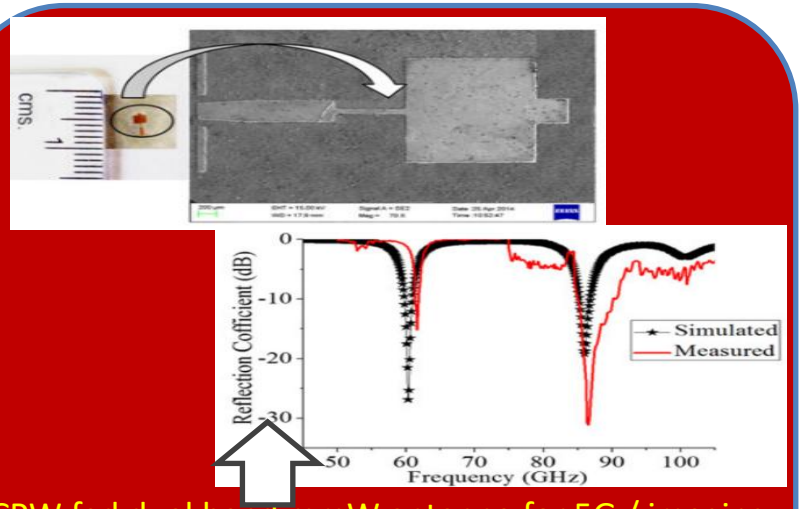
- **Microwave, mmW and THz Imaging for Target Detection and Identification**
- **Non-invasive sensor for Unknown material / liquid characterization**
- **Antenna Design for 5G Communication System / IoT Applications**
- **ANN, Machine Learning and Deep learning Applications**



Hidden crack detection using mmW Radar Imaging Published in ***IEEE Sensors***



Non-invasive water quality (TDS) sensor Published in ***Defense Science Journal -DRDO***



CPW fed dual band mmW antenna for 5G / imaging Applications Published in ***Cambridge IJMWT Journal***

RF, MICROWAVE RADAR IMAGING, SENSING APPLICATIONS AND MMW ANTENNA DESIGN

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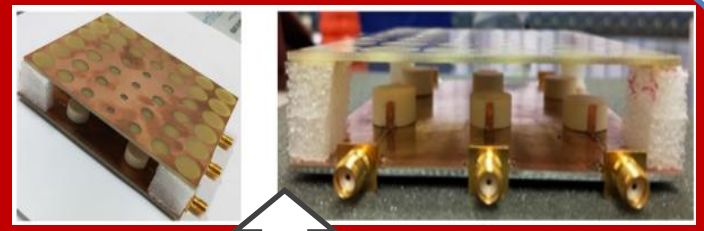
- **Dielectric Resonator Antenna**
- **Antenna Design for 5G Communication System**
- **Antenna for IoT Application**
- **UWB/SWB Antennas**

Quad Band Circularly Polarized Dielectric Resonator Antenna Published in IEEE Antennas and Wireless Propagation Letter

Composite Antenna for UWB applications Published in IEEE Antennas and Propagation Magazine



Beam Tilting MIMO Antenna for 5G Application Published in IEEE Antennas and Wireless Propagation Letter

Dielectric Resonator Antennas for 5G Communication System, IoT Applications and Defence Applications

Geographic Information System (GIS) Cell

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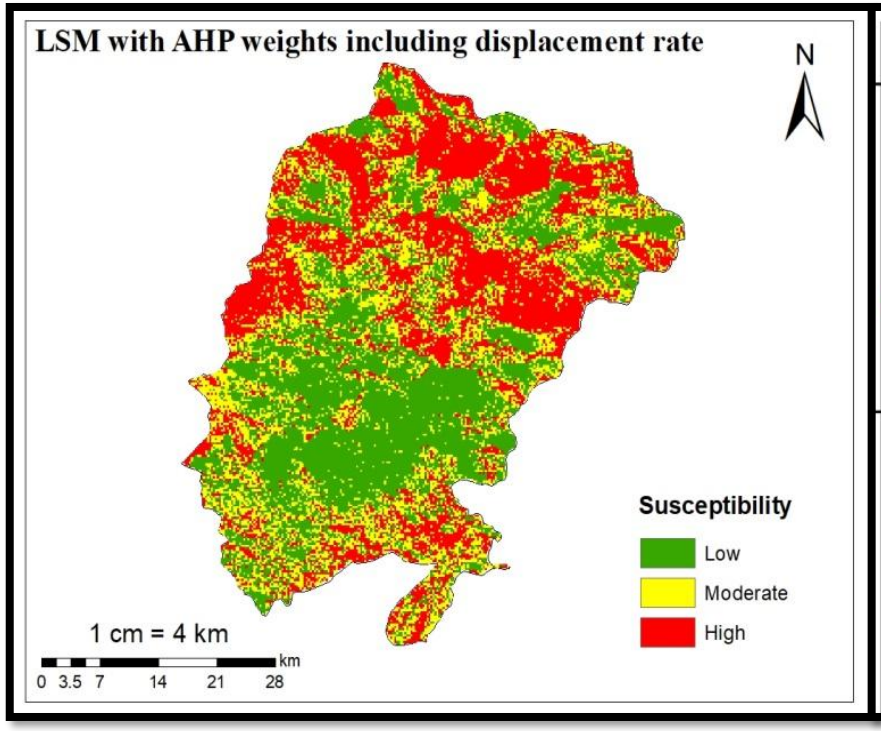
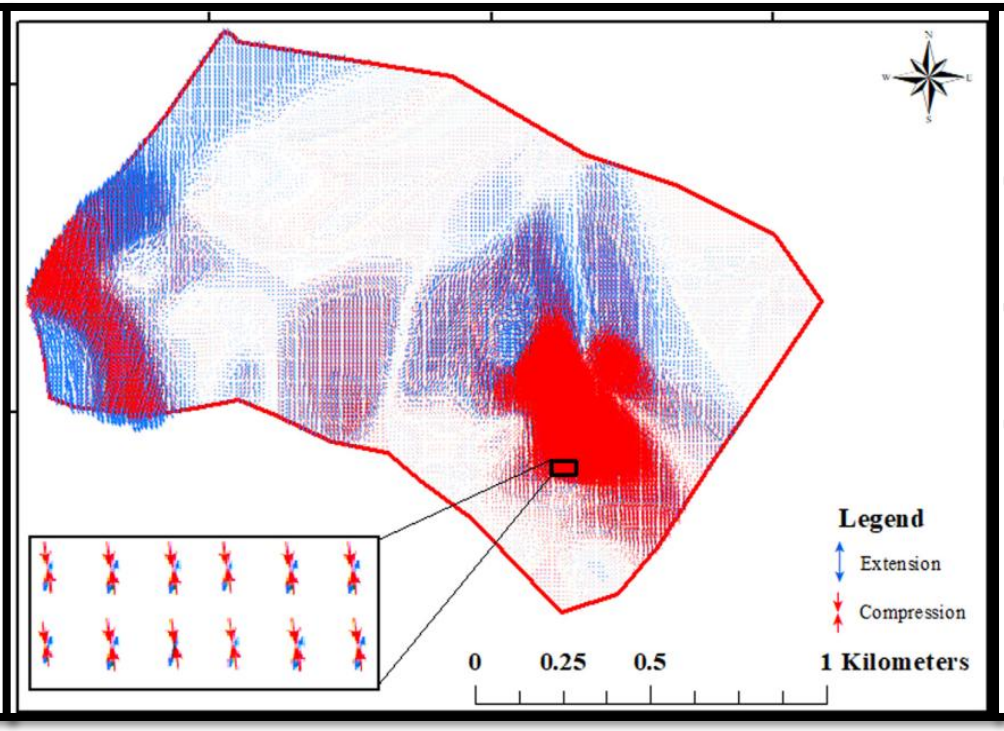
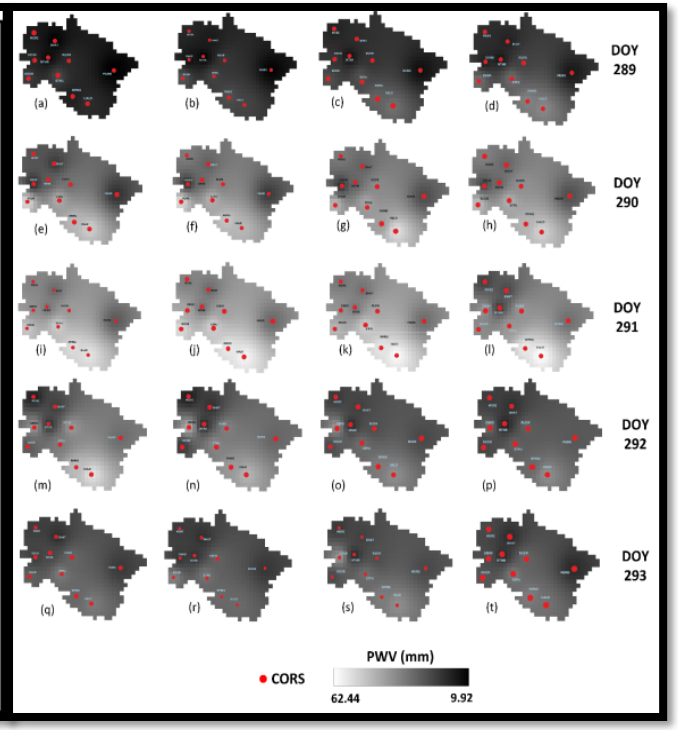
- Global Navigation Satellite System (GNSS) and Advanced SAR Interferometry (InSAR)
- Multi-sensor geodetic approach for surface deformation monitoring
- GNSS Meteorology



Landslide susceptibility mapping (LSM) Mapping



EO based strain field estimation



Spatial-temporal PWV variations

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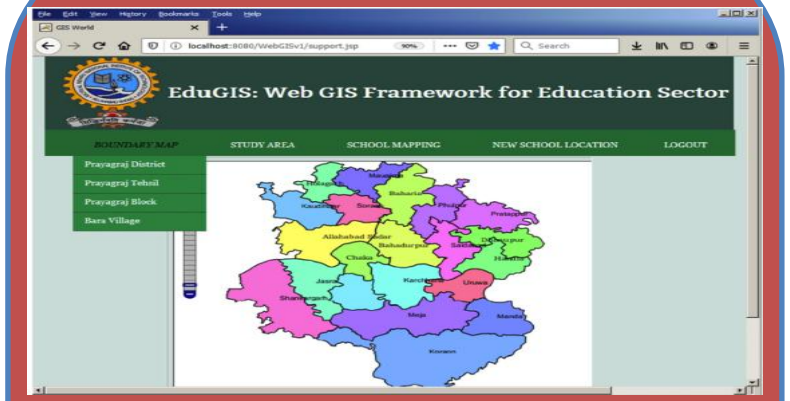
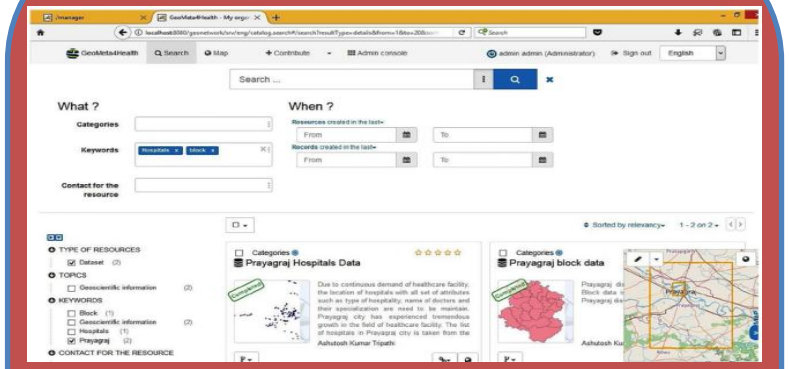
- **Geoinformatics**
- **Web GIS**
- **Image Processing**



Development of SOA-based WebGIS framework for education sector

Arabian Journal of Geosciences (2020)

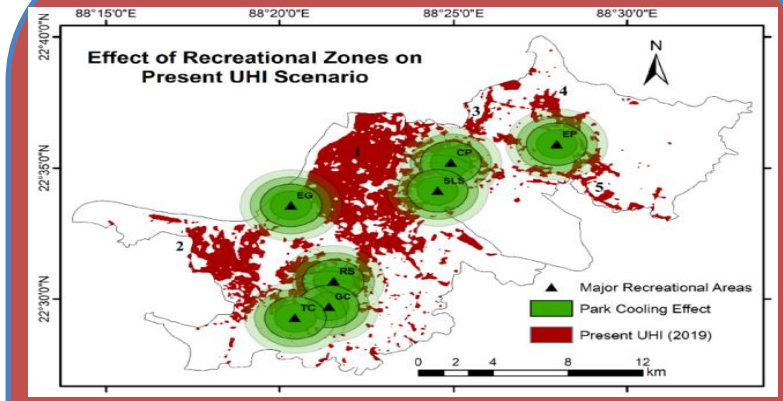
DOI: 10.1007/s12517-020-05490-9



Development and implementation of automatic metadata generation framework for SDI using OSS: a case study of Indian NSDI

Arabian Journal of Geosciences (2022)

DOI: 10.1007/s12517-022-09635-w



Synergetic interaction between spatial land cover dynamics and expanding urban heat islands

Environmental Monitoring and Assessment (2021)

DOI: 10.1007/s10661-021-08969-4

Geoinformatics in SDI and education sector to satellite image processing

Dr. Manohar Yadav

PhD [in Joint Supervision: IIT-K & MNNIT-A], MNNIT-A, India

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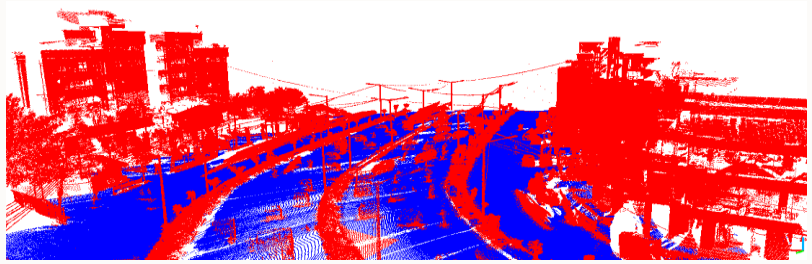
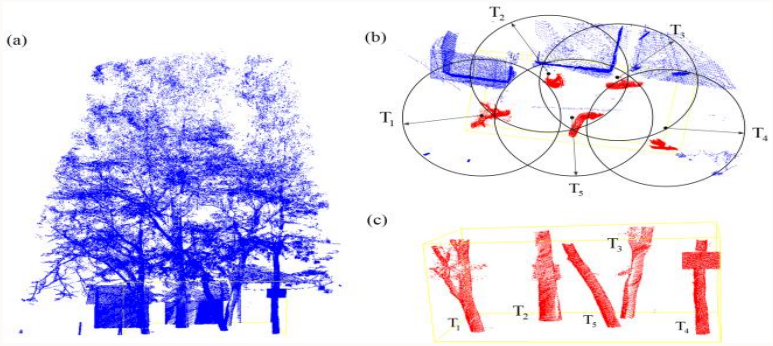
- **High resolution remote sensing** (i.e. Airborne, UAV-based, mobile and ground-based LiDAR) data collection & processing for scientific and industrial applications.
- **Objects detection and classification** using LiDAR point cloud and image data for applications, viz. urban planning, forestry, transportation (Roads and Rails), many more.
- **Multi-sensor fusion, calibration, and data generation:** Design and development of sensor's integration and data-fusion framework for the applications, viz. precision agriculture, etc.

Urban Planning



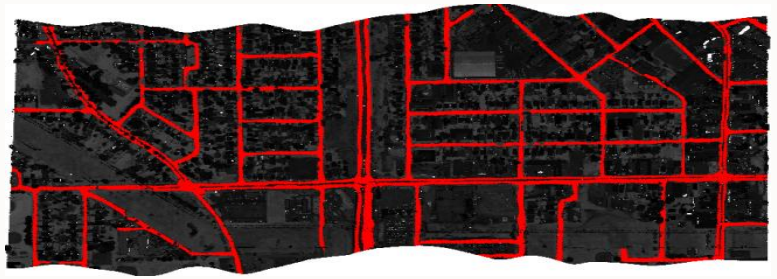
An automatic hybrid method for ground filtering in mobile laser scanning data of various types of roadway environments. ***Automation in Construction*** 126, 2021, 103681 (1-17) [SCI (Q1), IF- **7.7 ranked 2nd** out of 136 Journals in Civil Engineering]

Forestry

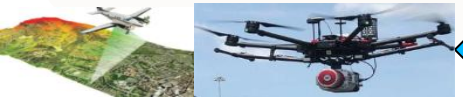


Identification of trees and their trunks from mobile laser scanning data of roadway scenes. ***International Journal of Remote Sensing*** 41(4), 2020, 1233-1258. (SCI, IF- **3.151**)

Roads & Highways



A multi-constraint combined method for road extraction from airborne laser scanning data. ***Measurement*** 186, 2021, 110077 (1-14) [SCIE (Q1), IF - **3.927**]



High resolution remote sensing for scientific and industrial applications

Department of Humanities & Social Sciences

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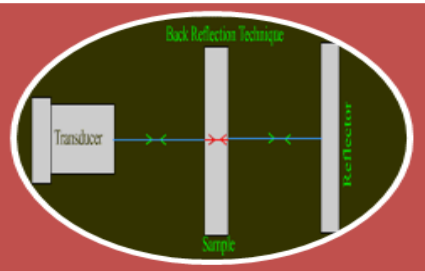
- English Literature
- Indian Writing in English
- Post-Colonial Writings
- North –East Literature

Material Eco-Criticism

Post-Colonial writing with reference to V S Naipaul



North –East Literature

AREA OF RESEARCH

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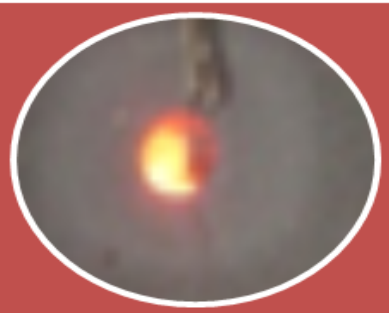
- **Public Policy/Focus 1**
- **Human Resource Management/Focus 2**
- **E- HRM/Focus 3**

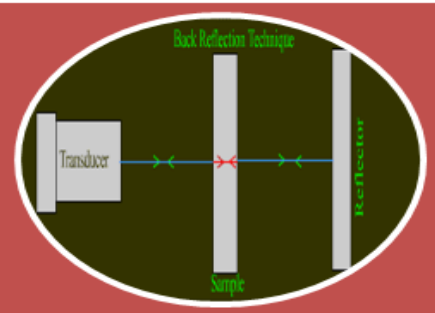
APPLICATION 1

Social Issues and Options



APPLICATION 2

Human Resource Issues and Options



APPLICATION 3

Organizational Problems and Challenges

BROAD DESCRIPTION OF THE BANDWIDTH/AREA OF RESEARCH

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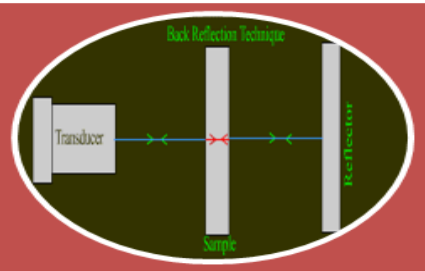
- **Research Area: Accounting & Finance**
- **Research Area: Business Economics**
- **Research Area/Focus 3**

APPLICATION 1

Securities Analysis

APPLICATION 2

Financial Reporting



APPLICATION 3

Unorganised Sector

Dr. Mitu Mandal

Ph.D, Defence Institute of Psychological Research, DRDO, Delhi, India.
(Registration: Bharathiar University, Coimbatore.)
Assistant Professor, Dept. of Humanities & Social Sciences
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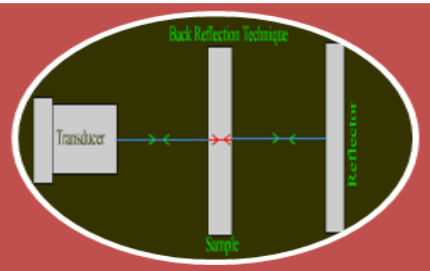
- **Applied Psychology**
- **Organisational Behaviour**
- **Learning and Development**
- **Human Resource Management**

Psychological Assessment

Group/Team Dynamics



Organisation Effectiveness

AREA OF RESEARCH

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Assistant Professor, Dept. of Humanities & Social Sciences

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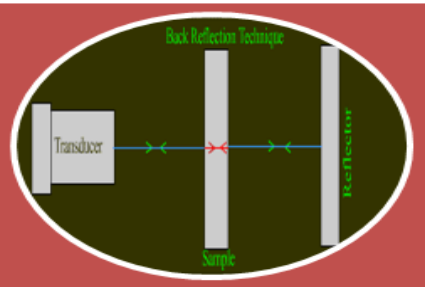
- English Language Teaching
- Curriculum and Materials Production
- Teacher Education
- English for Specific Purposes

Developing L2 proficiency in learners from disadvantaged backgrounds

Content Integrated Language Learning



Autobiographies as modes of self-reflection

AREA OF RESEARCH

Department of Mathematics

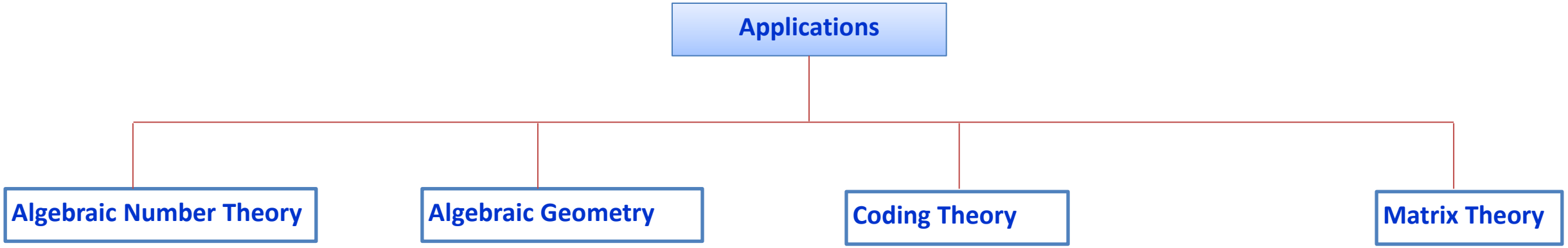
Prof Shiv Datt Kumar

Ph.D.: HRI+ Allahabad University, India

Professor [HAG], Dept. of Mathematics

0532 227 1252; sdt@mnnit.ac.in , http://www.mnnit.ac.in

- **Research Area/Focus 1:** Commutative Algebra.
- **Research Area/Focus 2:** Representation Theory
- **Research Area/Focus 3:** Cryptography



1. Commutative algebra is a part of algebraic geometry to study properties of geometric objects and study of the rings occurring in algebraic number theory as the important class of rings of algebraic integers (Dedekind rings)
2. Representation theory reduces problems in abstract algebra to problems in linear algebra.
3. Algebra and number theory are used in cryptography for secure communication.

Prof. (Dr.) Pankaj Srivastava

M.Sc.(Gorakhpur University), Ph.D.(Purvanchal University)
Professor, Dept. of Mathematics

Area of Specialization:

- Fuzzy Analytics
- Design and Development of Soft Computing Intelligent Systems with reference to Medical diagnosis and Tourism
- Ramanujan's Computational systems
- Tensor Analysis and Market Research

1. P.Srivastava, N.Sharma, and L.Guran : A Study on Medical Diagnostic Approach to Investigate Cardiac Diseases Lecture Notes in Networks and Systems, vol.518,pp.1-13,2022 Springer, Singapore.
2. P. Srivastava, S. Srivastav, T. Zhyber, and D. Hryzohlazov "Smart Sustainability Ranking System Within Local Budgeting", Economics of Development, vol. 19, no. 4, pp. 24–34, Mar. 2021 (KYIV UNIVERSITY, UKRAIN) (BUISSNESS PERSPECTIVES)
3. P. Srivastava, S. Srivastav: Soft Computing Market Research Analytics on Recommendation for Tourist Destinations in Varanasi-India", IJAST, vol. 29, no. 4s, pp. 791 - 807, Mar. 2020

Dr. Mukesh Kumar

Professor, Dept. of Mathematics

M Sc, M Phil, PhD: IIT Roorkee, India

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Qualified (GATE), 1999 with Percentile Score **99.34** & All India Rank **5th**

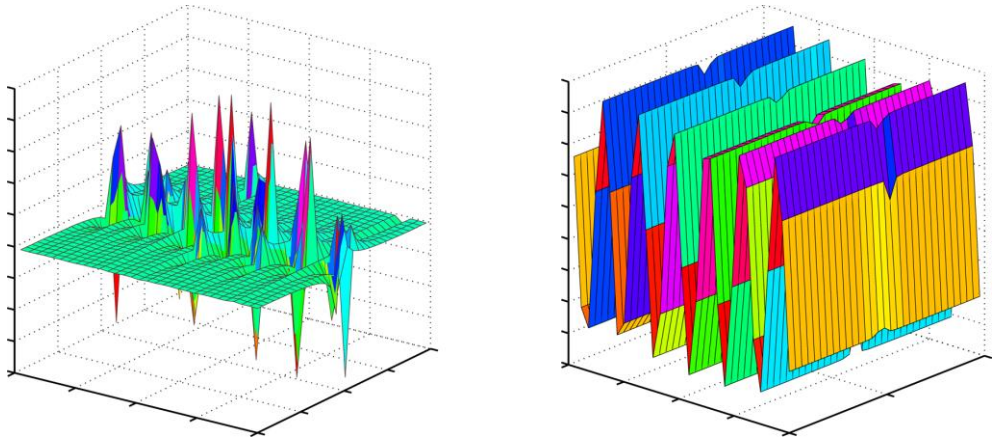
(NET-CSIR) JRF Four Times, 1998, 2000, 2001 & 2004.

Research Area/Focus1: **Non-linear Partial Differential Equations**

Research Area/Focus2: **Similarity Transformations Method**

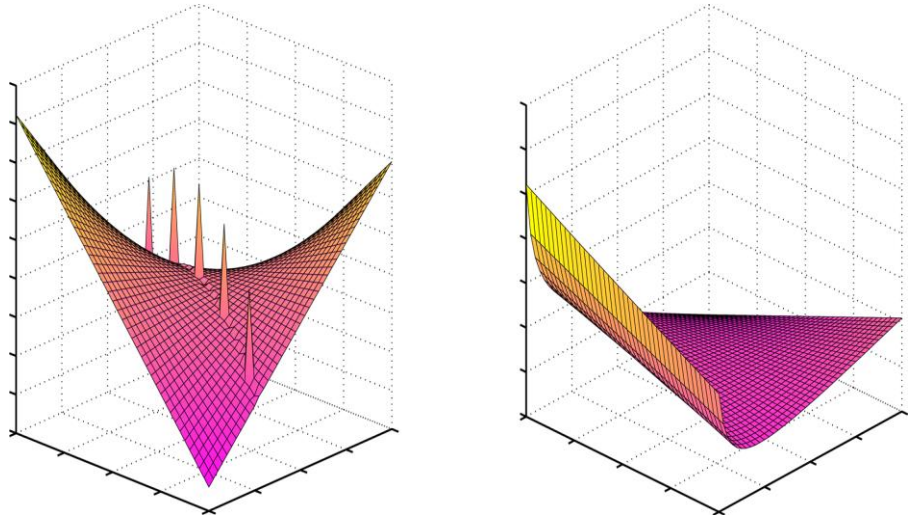
Research Area/Focus3: **Lie-Symmetry Analysis**

Citations: 922 **h-Index: 21** **i10-Index:34**



Multisoliton and wavefront profile

Nonlinear Dynamics, 94(4), 547–2561, (2018)



Annihilation of stripe solitons

Nonlinear Dynamics, 106(4), 3453–3468, (2021)

Dr. Pitam Singh

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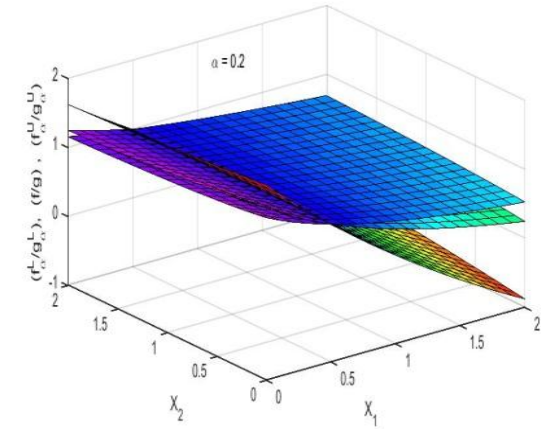
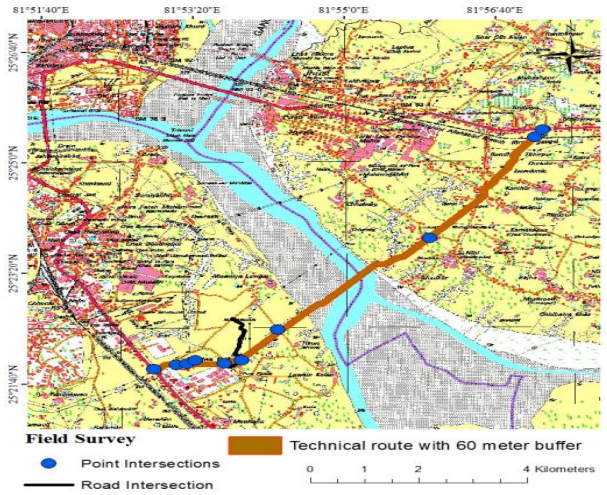
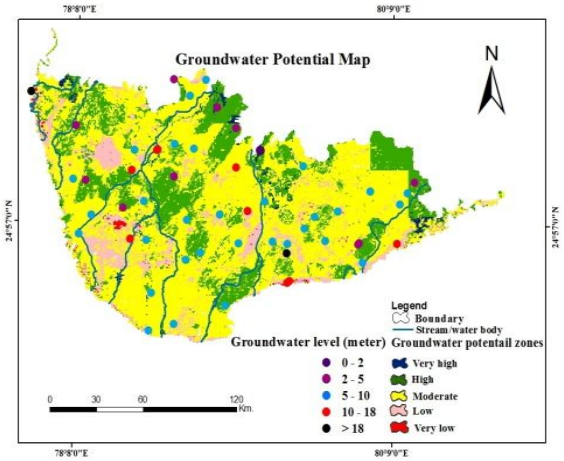
- **Research Area/Focus 1: Fuzzy Multi-objective Optimization Theory and Applications**
- **Research Area/Focus 2: Fuzzy Multi-criteria GIS Modelling for Route Planning and Identification of GWP Zones.**
- **Research Area/Focus 3: Mathematical Modelling in Seismology**



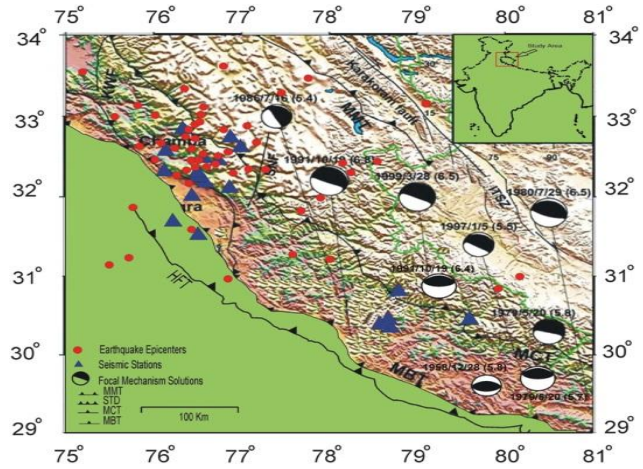
Application 1: Global fuzzy efficient solution representation
[*Soft Computing*, **23: 197–210 (2019)**]



Application 2: Optimum route alignment planning
[Journal of Geographical Systems 21:395–432 (2019)]



Application 3: Groundwater potential map of Bundelkhand craton [**GEOCARTO INTERNATIONAL https://doi.org/10.1080/10106049.2021.1946170 (2021)]**



Application 4: Attenuation of short-period body waves in Northwestern Himalayan Region, India [***Soil Dynamics and Earthquake Engg.*** **114:, 555-562 (2018)]**

Dr. Gorakh Nath,

Ph.D., DDU Gorakhpur University, India

Associate Professor and Head, Dept. of Mathematics

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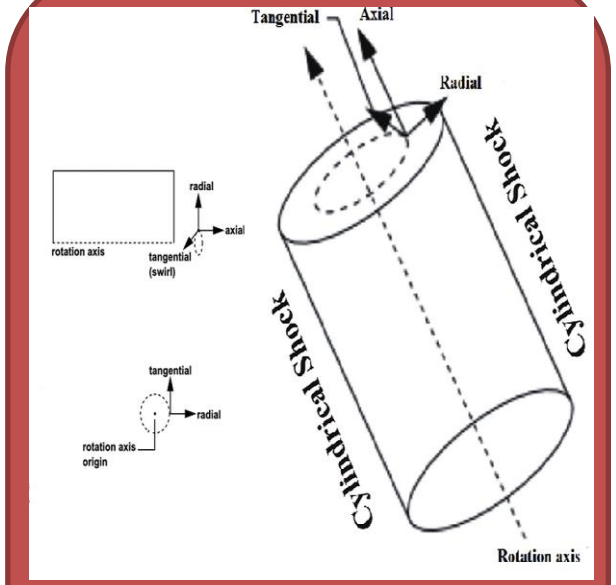
RESEARCH OUTCOME*	
SCI/Scopus Publications	85
Book Chapter	02
Conference Proceedings	04
PhD's Awarded	04

Fluid Dynamics-Shock Wave
Two Phase Flows
Lie Symmetry Analysis

RESEARCH IMPACT & MATRICS*	
Citations	1317
H-index	21
i10-index	42



A schematic description of the directions of the velocity vector components and shock wave (Acta Astronautica [2019])

Applications

Application of Shock Waves

- In Industries
- In Medical Sciences
- To Design Space Vehicle
- To reduce drag force in supersonic flight
- In description of Star and Planet formation
- In Engineering Problem.

Future Application of Shock Waves

- Now a day astronomer plan is to do mining in space to extract Water, Iron, Uranium from rocky planet (Planet on which we can land) these would not be happen without shock waves.

Achievements

- Listed name in 2% Worlds Scientist/Researcher:

  In Surveyed by Standford University; Stanford, California, United States in 2022, 2021 and 2020

- Outstanding Reviewer Award by Editors of Journals:

  Computers and mathematics with Applications in 2017, Elsevier

  and

  Ain Shams Engineering Journal in 2017, Elsevier

Dr. Pramod Kumar Yadav

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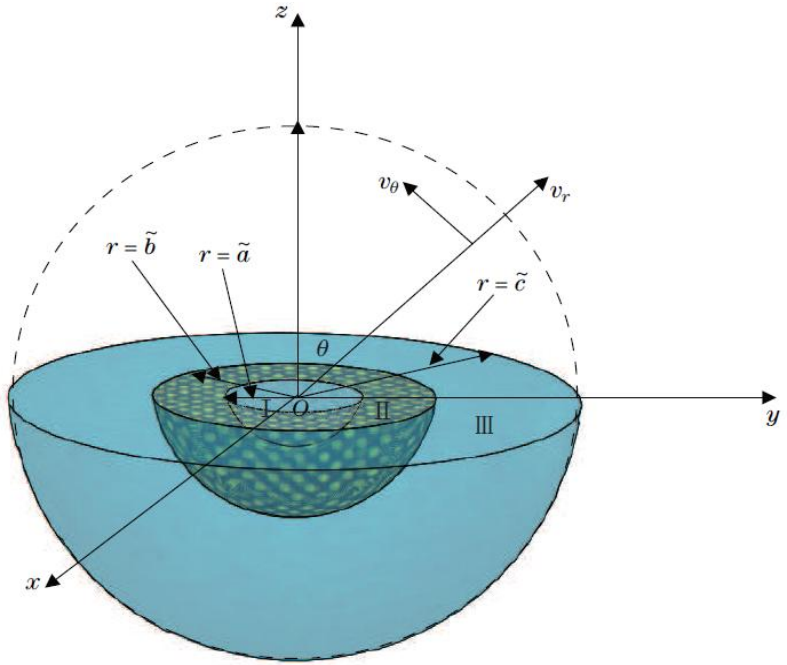
Research Area / Focus1 : Fluid Mechanics

Research Area / Focus2 : Bio-Fluid Mechanics

Research Area / Focus3 : Differential Equation



Motion through spherical droplet with non-homogenousporous layer in spherical container [Appl. Math. Mech. -Engl. Ed., 41(7), 1069–1082 (2020)]

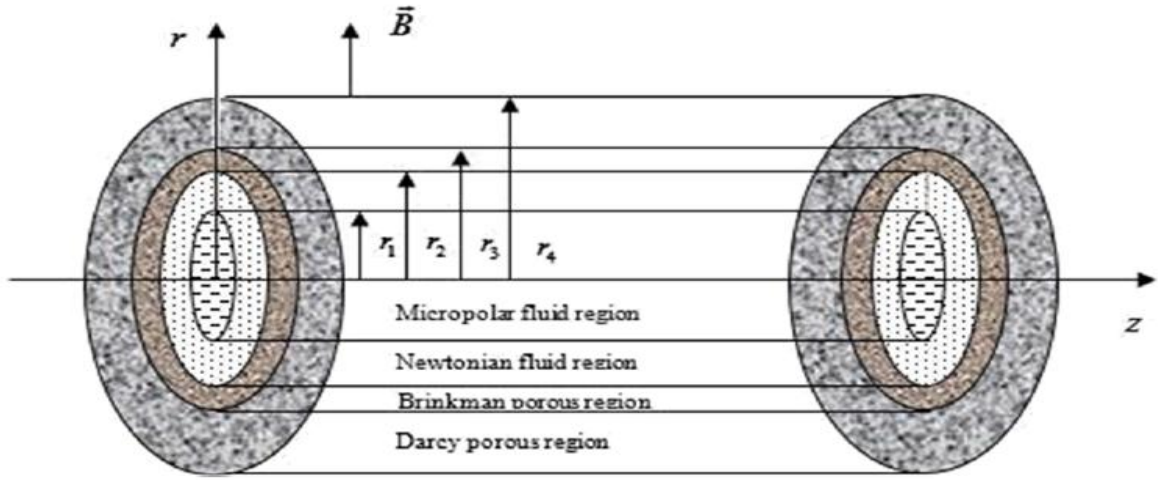


FIG. 1. Schematic diagram of the blood flow model.

A micropolar-Newtonian blood flow modelthrough a porous layered artery in the presence of a magnetic field [Phys. Fluids 31, 071901 (2019)]

Dr. Sahadeo Padhye

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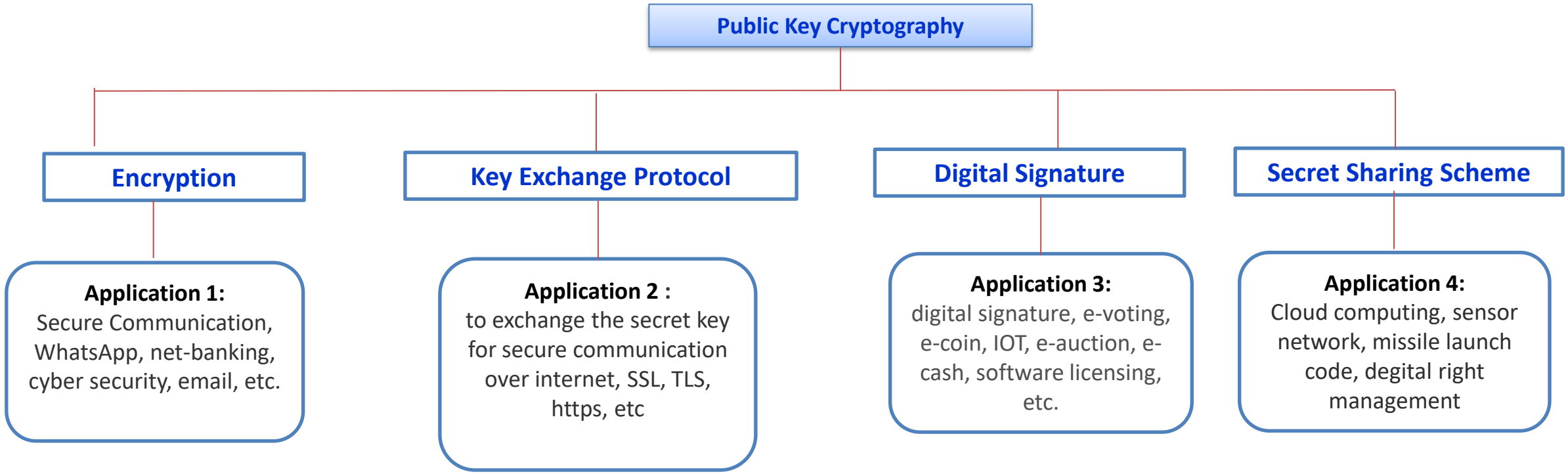
- **Research Area/Focus 1: Public Key Cryptography.**
- **Research Area/Focus 2: Multivariate and Lattice Based Cryptography**
- **Research Area/Focus 3: Digital Signature.**



Dr. Surabhi Tiwari

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- **Research Area/Focus 1 : General Topology.**
- **Research Area/Focus 2 : Proximity structures**
- **Research Area/Focus 3 : Rough Sets and Fuzzy Rough Sets**

Proximity Structures

Image Analysis

Application 1:
Classification of digital Images which can be blur or fuzzy, contraction of digital images, etc.

Generalization of topological structures

Application 2 :
Unified study of various topological structures is possible.

Topological Extension problems

Application 3 :
Topological extension problems such as compactness, completion, fixed point theorems can be easily studied.

Dr. Buddakkagari Vasu

Ph.D., Sri Venkateswara University, India

Assistant Professor, Dept. of Mathematics

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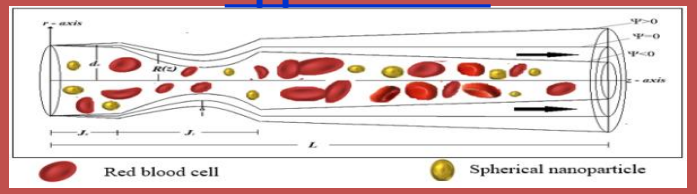
RESEARCH OUTCOME*	
Sponsored Projects	03
SCI/Scopus Publications	48
Conference Proceedings	19
PhD's Awarded	03

Computational Fluid Dynamics
Nano-Fluid Flows
Numerical Analysis

RESEARCH IMPACT & MATRICS*	
Citations	1105
H-index	19
i10-index	32

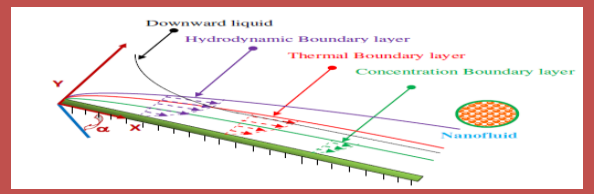
*As of 23/03/2023

Application-1



- The mathematical modelling of hydro-magnetic nano-hemodynamics have drug delivery applications for cardiovascular treatments.
- The nature of blood is discussed mathematically by considering it as viscous nanofluid.
- The simulations are relevant to the diffusion of nano-drugs in magnetic targeted treatment of stenosed arterial diseases

Application-2



- The first and second laws of thermodynamics are employed in order to study hydrodynamics along with heat and mass transfer of gravity-driven Ostwald-de-Waele power-law liquid film suspending with nanoparticles along an inclined plate.
- Nanofluids are uniformly stable and suspended in a liquid for heat transfer intensification, in industrial sectors including power generation, thermal therapy for cancer treatment, chemical sectors, ventilation etc.

Achievements

- **The Early Career Research (ECR) Award**, by Science and Engineering Research Board (**SERB**), 2018.
- **Research Award: 2014-16 by University Grants Commission, India.**

Dr. Supriya Yadav

Ph.D., University of Lucknow, India

Assistant Professor, Department of Mathematics

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- **Fluid Dynamics**
- **Bio-Mechanics**
- **Differential Equation Models in Epidemiology**

Applications of Fluid Dynamics

- Calculating forces and moments on aircraft
- Estimating drag forces on submarine hulls

Applications of reaction–diffusion equations

- Ground water pollution
- Drug delivery system

Application of Epidemiological models are useful in planning, implementing, prevention, evaluating various detection, therapy and control programs

BROAD DESCRIPTION OF THE BANDWIDTH/AREA OF RESEARCH

- Stokes flow around slowly rotating concentric pervious spheres
- Creeping flow past rotating axi-symmetric isolated body-class of deformed sphere
- Steady Oseen's flow past a deformed sphere: an analytic approach
- Steady Stokes flow past dumbbell shaped axially symmetric body of revolution- an analytic approach
- A reliable numerical method for solving fractional reaction-diffusion equations
- Analysis and dynamics of fractional order Covid-19 model with memory effect

Dr. Prashanta Majee

MSc, PHD (IIT Kharagpur), India

Assistant Professor, Department of Mathematics

prashanta@mnnit.ac.in, http://mnnit.ac.in/profile/prashanta

RESEARCH INTEREST:

- **Applied Functional Analysis**
- **Variational Inequality Problem (VIP), Equilibrium Problems (EP)**
- **Fixed Point Problems (FPP)**

OBJECTIVES: **(a) Iterative methods for common solution of VIP, EP, and their generalizations.**

(b) Study of VIP and EP through a dynamical system with applications.

(c) Split system of variational inequalities with application to traffic analysis.

(d) Iterative methods in fixed-point theory in various abstract spaces .

(e) Introduction of the weak sharp solution of the split variational inequalities .

$$
\begin{aligned}
&x_0 \in H_1,\\
&u_n = T_{r_n}^{F_1}(x_n + \gamma A^*(T_{r_n}^{F_2} - I)Ax_n),\\
&y_n = \beta_n x_n + (1-\beta_n)S_N^n S_{N-1}^n \cdots S_1^n u_n,\\
&x_{n+1} = \alpha_n \eta f(x_n) + (I - \alpha_n \mu D)y_n, n \geq 1,
\end{aligned}
$$

- **A viscosity iterative method has been introduced to capture common solutions of the equilibrium problem and fixed point problem. Strong convergence results are studied.**
- **Inertial iterative methods has been introduced for the solution of the split variational inclusion and fixed point problem. Weak convergence has been studied.**
- **Traffic analysis problem of two railway networks has been converted to split system of variational inequality. Weaksharpness and finite convergence analysis has been studied.**

Dr. Naren Bag

PHD, IIT Kharagpur, India

Assistant Professor, Dept. of Mathematics

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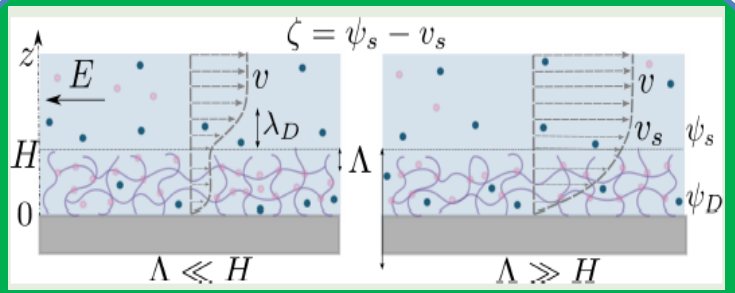
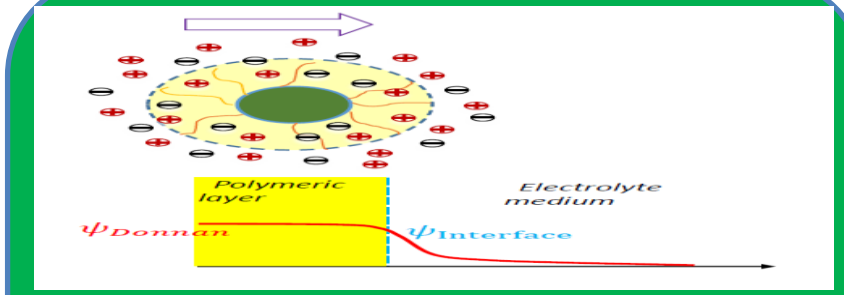
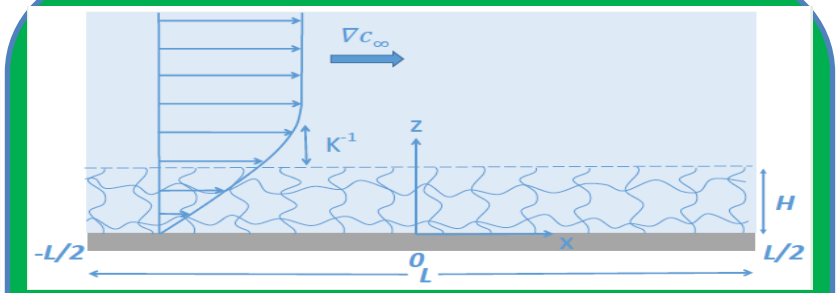
- **Theoretical and Numerical Analysis on Modulation of Electroosmotic Flow**
- **Electrophoresis of Bio-colloids in the extent of non-Newtonian Fluids**
- **Diffusioosmotic Flow near a Porous Films**



Charged porous film in contact with electrolyte solution



Bacteria, virus or several environmental entities can be modeled as composite soft particle



Diffusioosmosis in a hydrogel film in contact with electrolyte solution subject to an applied ionic concentration gradient

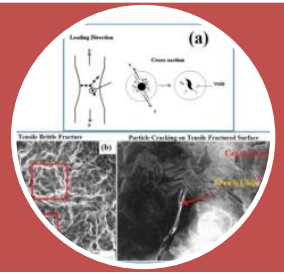
Computational Fluid Dynamics, Numerical Modeling of Microfluidics, Numerical Techniques for PDE and Applications, General Convection-Diffusion-Electromigation Process.

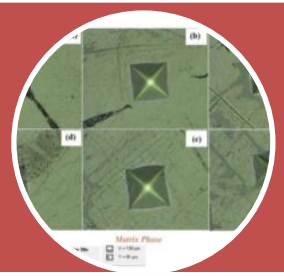
Department of Mechanical Engineering

Dr. Rajeev Srivastava

Ph.D, MNNIT Allahabad, India
Professor , Dept. of Mechanical Engineering
0532 2271514; rajmnnit@mnnit.ac.in , http://www.mnnit.ac.in

- **Computer Aided Design & Manufacturing (CAD/CAM),**
- **Additive Manufacturing,**
- **Mechatronics and Automation.**





Contents lists available at ScienceDirect
Advanced Powder Technology
journal homepage: www.elsevier.com/locate/apt
ELSEVIER

Original Research Paper

The effect of copper granules on interfacial bonding and properties of the copper-graphite composite prepared by flake powder metallurgy

Manish Dixit *, Rajeev Srivastava
Department of Mechanical Engineering, Motilal Nehru National Institute of Technology Allahabad, UP 211004, India

Transactions of the Indian Ceramic Society
ISSN: 0371-750X (Print) 2165-5456 (Online) Journal homepage: https://www.tandfonline.com/loi/tcer20

Influence of Fine Al_2O_3 and Aluminium Nano-Particles on the 6061 Aluminium Alloy near the Grain Boundary of the Semi-Solid Cast Microstructure

Mayank Agarwal & Rajeev Srivastava

MIT International Journal of Mechanical Engineering, *Vol. 4, No. 2, August 2014, pp. 90-93* 90
ISSN 2230- 7680 © MIT Publications

Performance Improvement of Light Vehicle Suspension System Using PID and Fuzzy Logic Controllers

Mohd. Avesh
Research Scholar

Rajeev Srivastava
Associate Professor

BROARD DESCRIPTION OF THE BANDWIDTH/AREA OF RESEARCH

Prof. Manoj Kr Khurana

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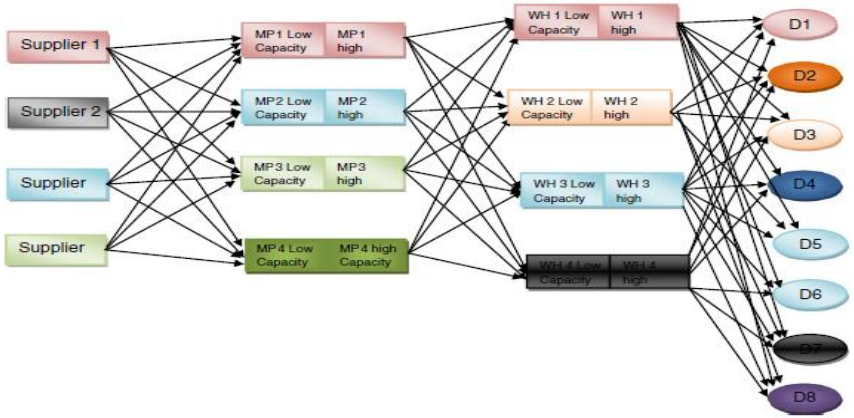
BROAD DESCRIPTION OF THE BANDWIDTH/AREA OF RESEARCH

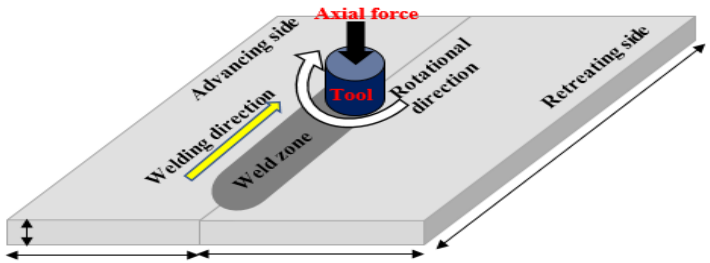
Supply Chain Management

Production & Operations

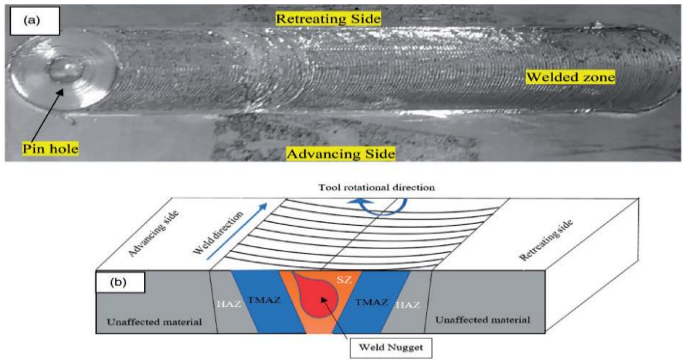
Manufacturing



The Schematic diagram of the supply chain considered in the model



Schematic diagram of Friction stir welding.



Friction Stir welded zone (b) the Schematic diagram of Friction Stir Welding and different zone of welding.

Dr. Venkateswara Rao Komma

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- **Computer Aided Manufacturing, STEP based CAD/CAM integration**
- **Additive Manufacturing and Advanced Manufacturing Processes**
- **Modelling and Simulation of Advanced Manufacturing Systems**

CNC Retrofitting

Additive and Advanced Manufacturing Processes

Advanced Manufacturing Systems

Advanced Manufacturing Systems and Processes

Dr. J. C. Mohanta

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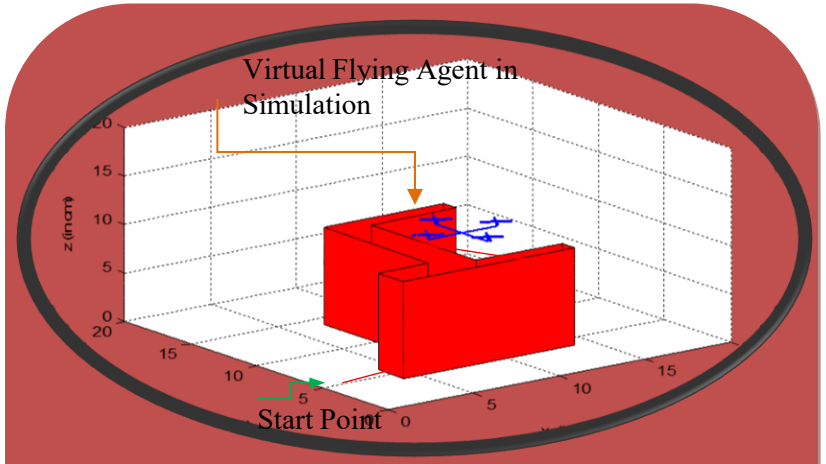
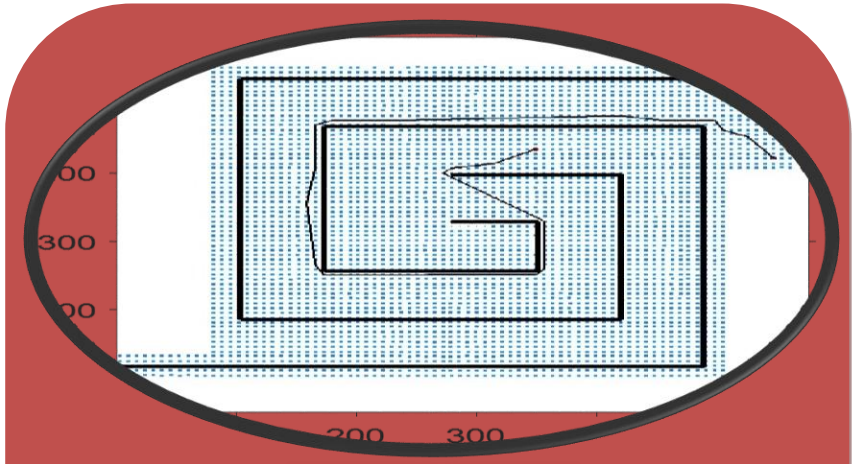
Robotics/Mechatronics

Unmanned Aerial Vehicles

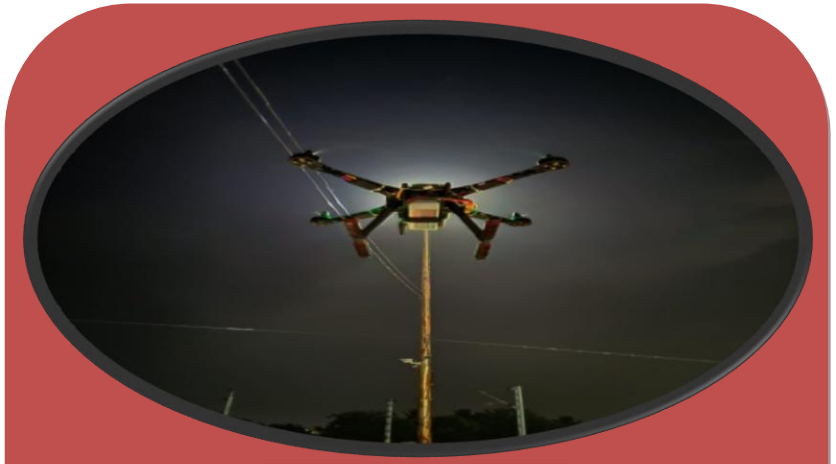
AI based Fault Detection



The simulation scenario of obstacle avoidance by flying Quad copter
(Published in Arabian journal for science and engineering, 43, page:1395–1407 (2018)



Navigational Path/trajectory traced by mobile robot (Simulation environment)
Published in Applied Soft Computing, 79, page: 391-409 (2019)



Real time Online Power Line Inspection using UAV
Published in Materials Today: Proceedings, 51, 261-268, (2022)

1. MOBILE ROBOT PATH PLANNING & OBSTACLE AVOIDANCE, 2. CORRIDOR NAVIGATION, 3. POWERLINE INSPECTION USING UAV

Dr. Bireswar Paul

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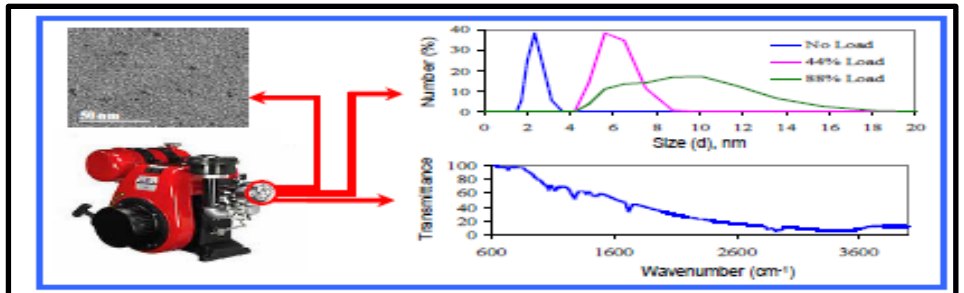
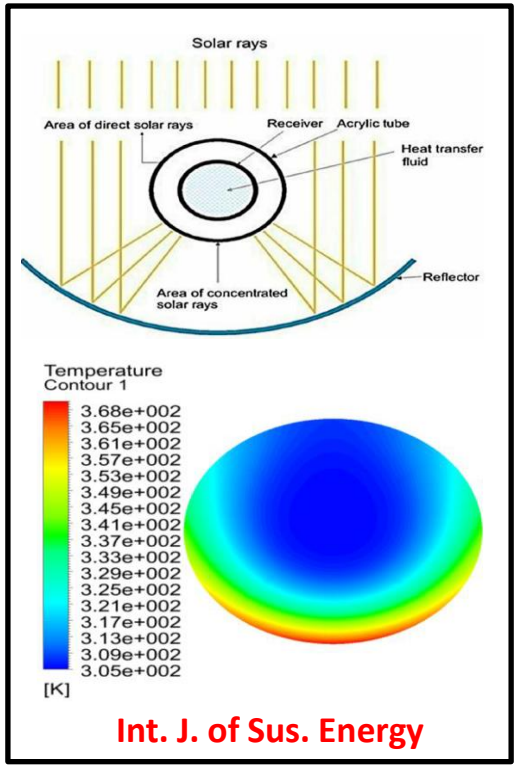
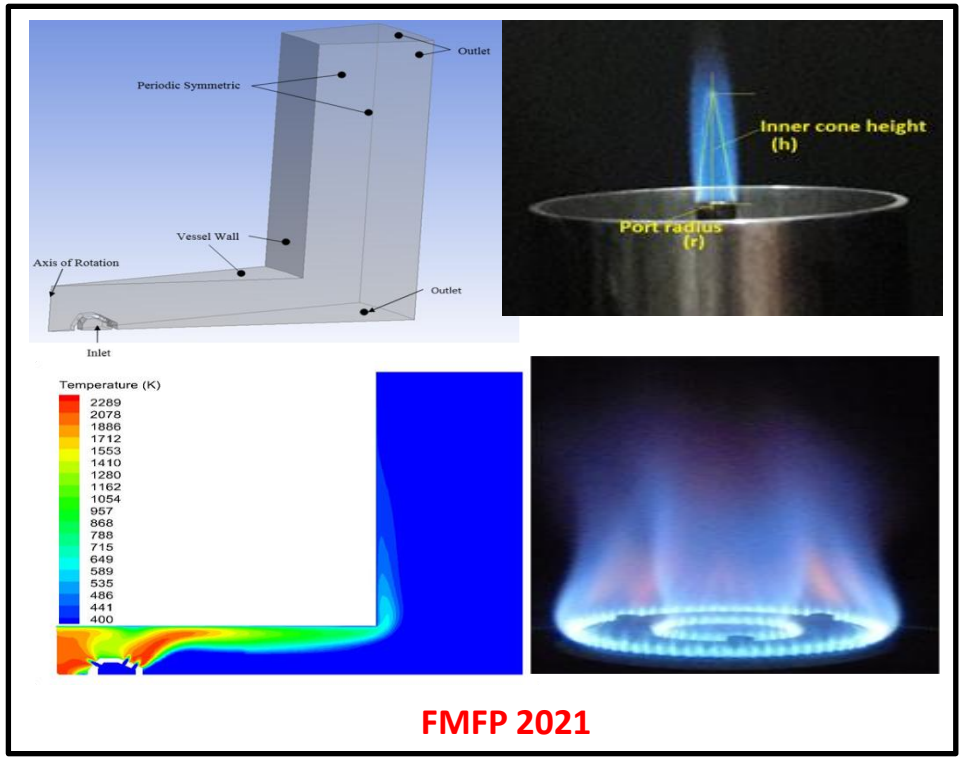
- **IC engine combustion and pollution**
- **Heat transfer analysis of Solar PTC**
- **Combustion analysis biogas fuel**



Particuology/Lubrication Science



Int. J. of Sus. Energy



FMFP 2021

Dr. Sunil Kumar Gupta

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Assistant Professor, Dept. of Mechanical Engineering

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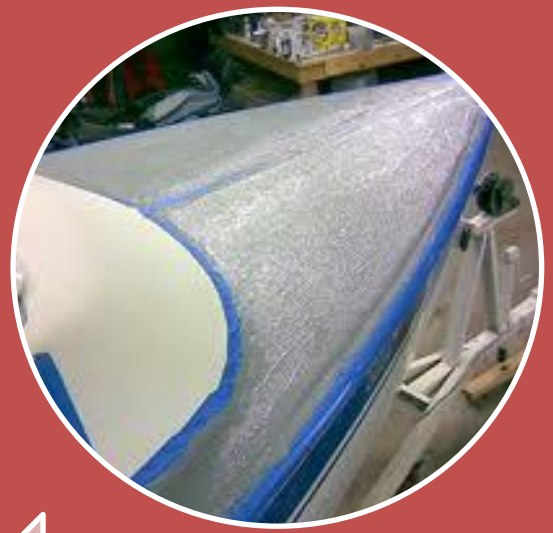
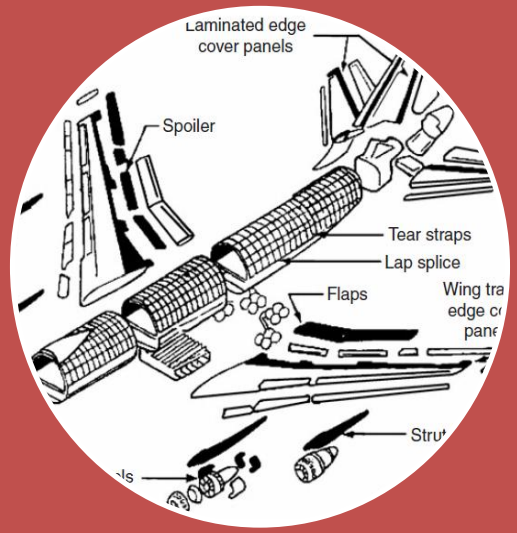
- **Smart and Nanocomposite Adhesive**
- **Polymer Nanocomposites and Foam**
- **Experimental and Computational Stress Analysis**
- **Fracture and Fatigue**





Joining of Composite and Metal Materials

Dr. Skylab P Bhore

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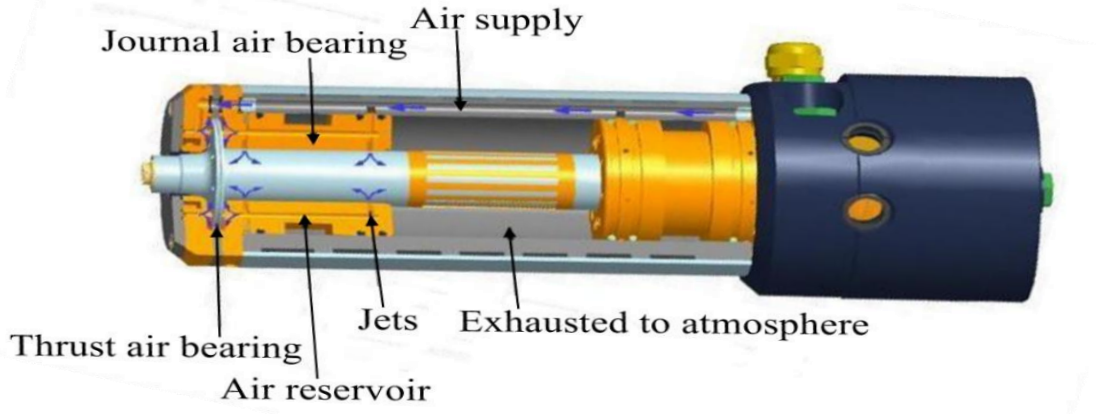
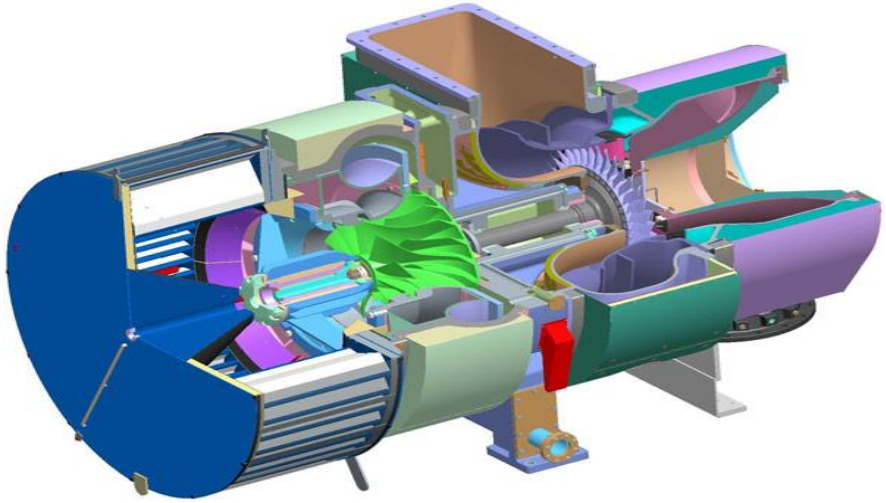
- **Air Bearings /Texture effect, Bionic texture**
- **Gas Foil Bearings/ Design, fabrication, testing**
- **Rotor Dynamics/ Nonlinear Dynamics, Machine Learning**



PCB drilling spindle



Turbocharger

1) **Air bearings are used to support a low load and high speed applications. The present research is focussed on the use of texture effect to reduce wear and friction .**
2) **The gas foil bearings are used to support high speed and high/cryogenic temperature applications. The present research is focussed on design, fabrication and testing.**

Dr. M. K. Gupta

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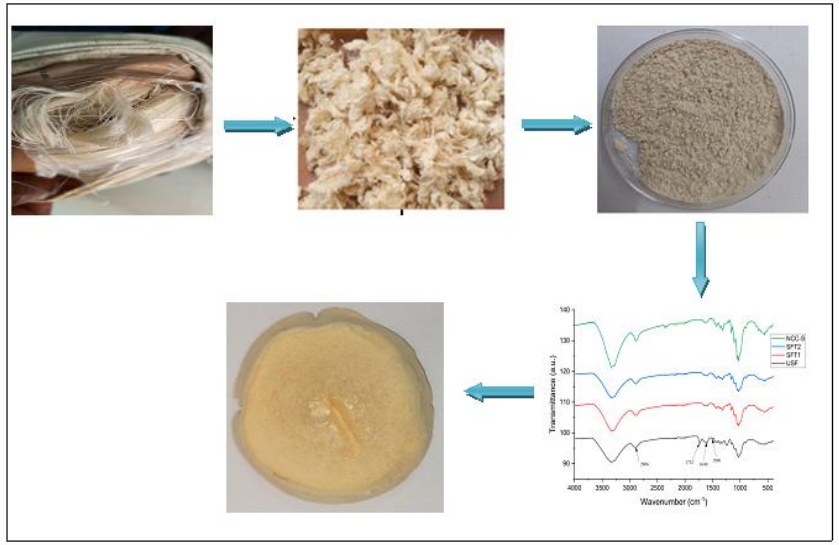
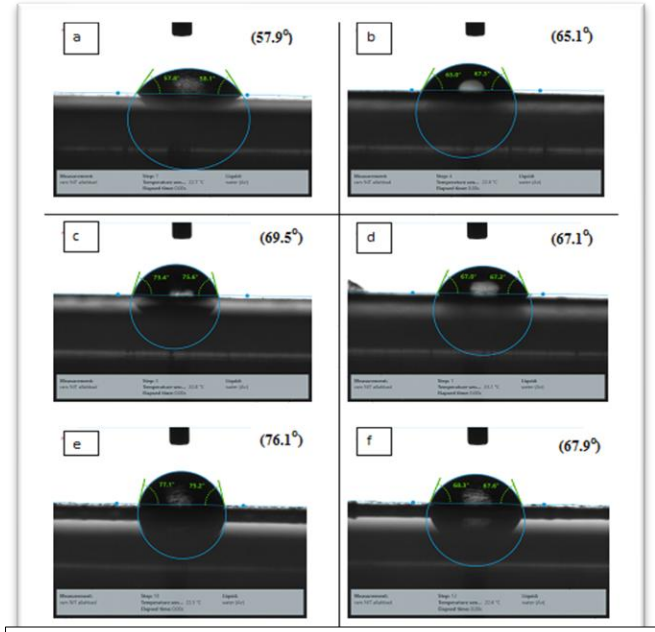
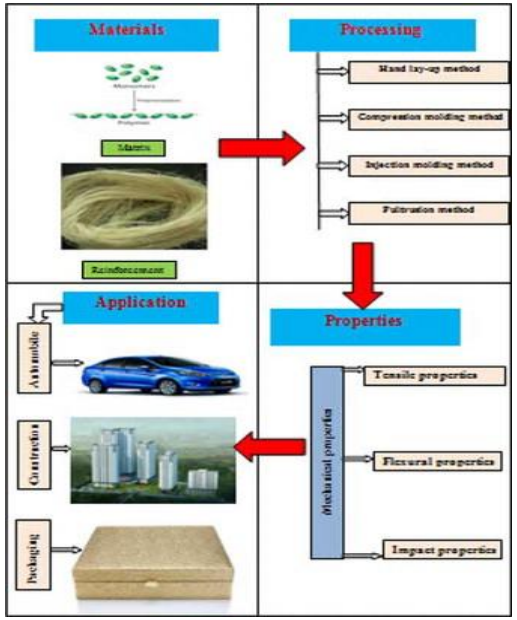
- **Biocomposites for sustainable products**
- **Nanocomposites for advanced applications**
- **3D Printing of advanced composites**



Nanocellulose for development of aerogel



Contact angles for nanocomposite films



Biocomposites for sustainable products

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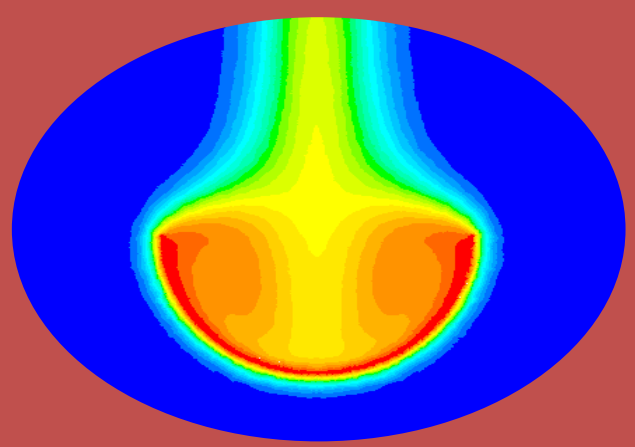
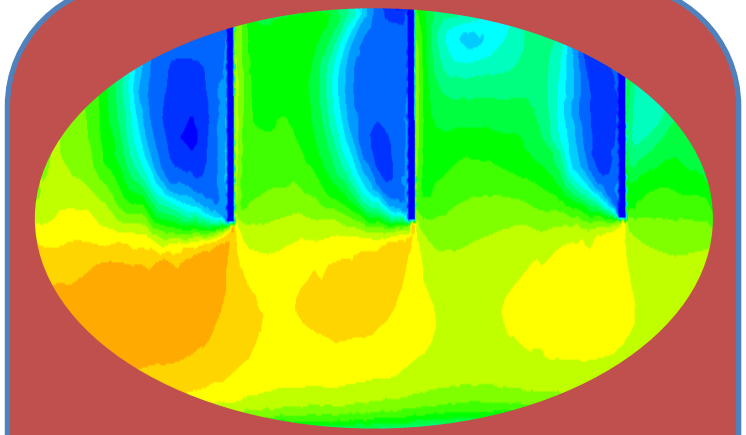
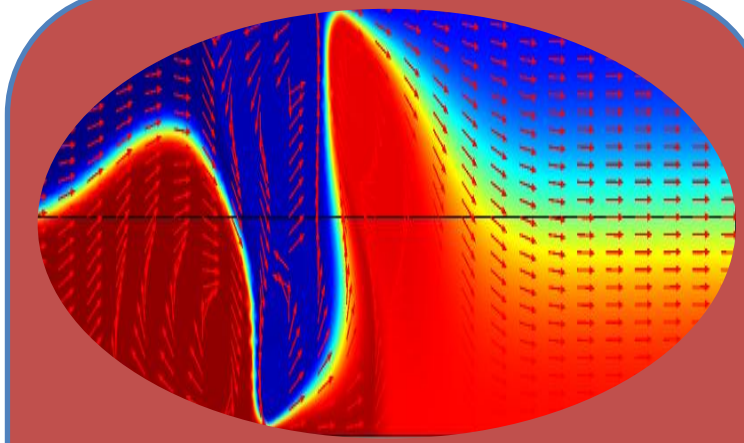
- Natural/Forced Convection
- Computational Fluid Dynamics
- Thermo-Fluid Dynamics in Micro-Channel



APPLICATION 1



APPLICATION 2



APPLICATION 3

BROAD DESCRIPTION OF THE BANDWIDTH/AREA OF RESEARCH

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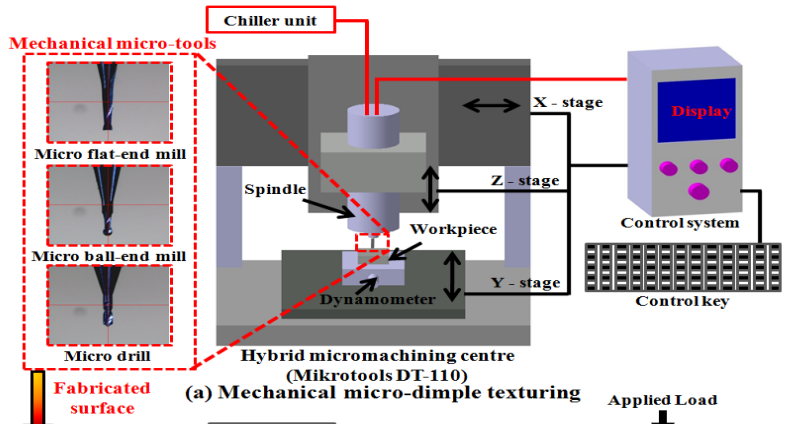
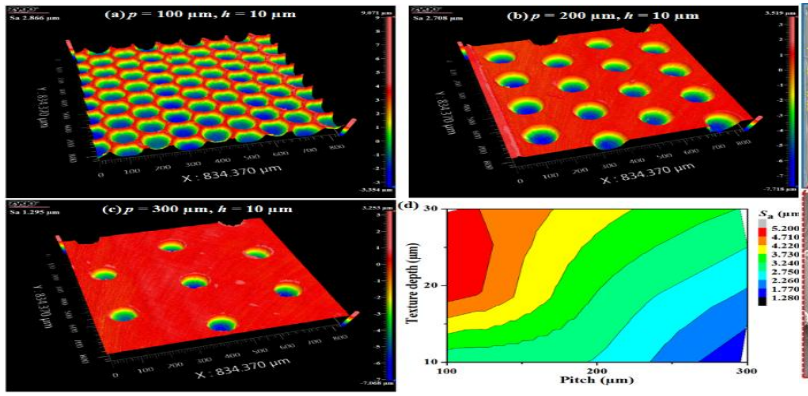
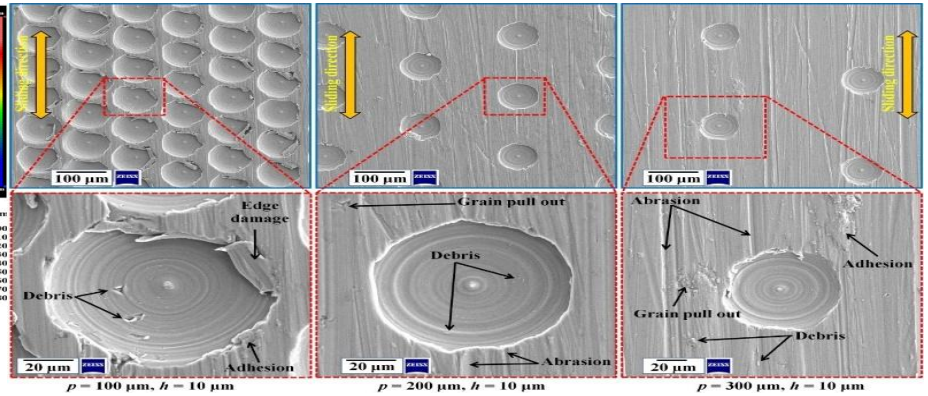
- **Mechanical Micro-fabrication**
- **Surface and Interface Engineering**
- **Tribology**
- **Finite Element Modeling and Optimization of Advanced Manufacturing Processes**



(a) Mechanical micro-dimple texturing

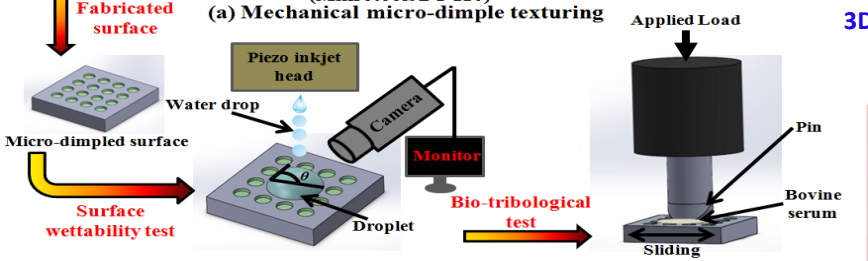


3D view of fabricated micro-textured surfaces and their area surface roughness



Worn micro-textured surface after tribological test under hip joint cond.

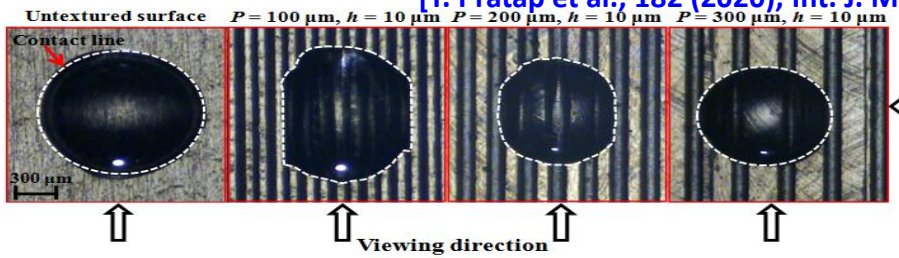
[T. Pratap et al., 182 (2020), Int. J. Mech. Sci.]



(b) Contact angle measurement (c) Reciprocating pin-on-disc test

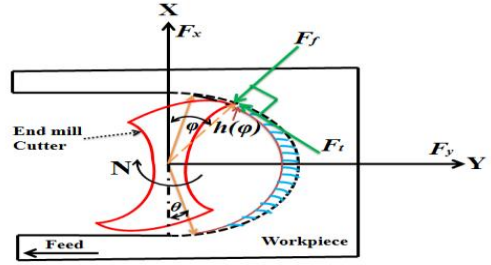
Mechanical micro-texture fabrication, droplet dynamics on textured surface and Biotribological testing of hip joint

[T. Pratap et al., 349 (2018), Surf. Coat. Technol.]



Droplet distortion and stretching on micro-grooved surface

[T. Pratap et al., 356 (2018), Surf. Coat. Technol.]



Micro milling with two fluted micro mill

[P. Sahoo, T. Pratap and K. Patra, 150 (2019), Int. J. Mech. Sci.]

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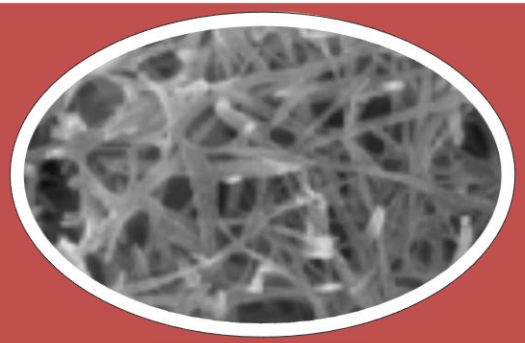
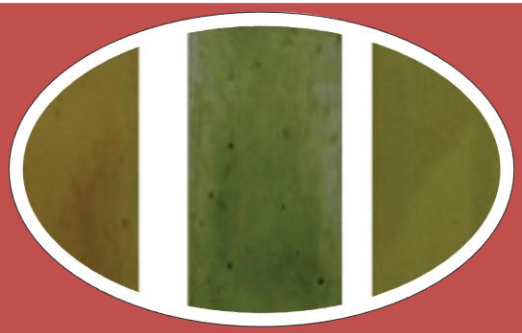
- **Research Area/Supercapacitors**
- **Research Area/Electrochromic Materials**

Physica B 629 (2022) 413638



J. Alloys Compd. 867 (2021) 159022



J. Sol-Gel Sci. Technol. 95 (2020) 34

EXPERIMENTAL CONDENSED MATTER PHYSICS

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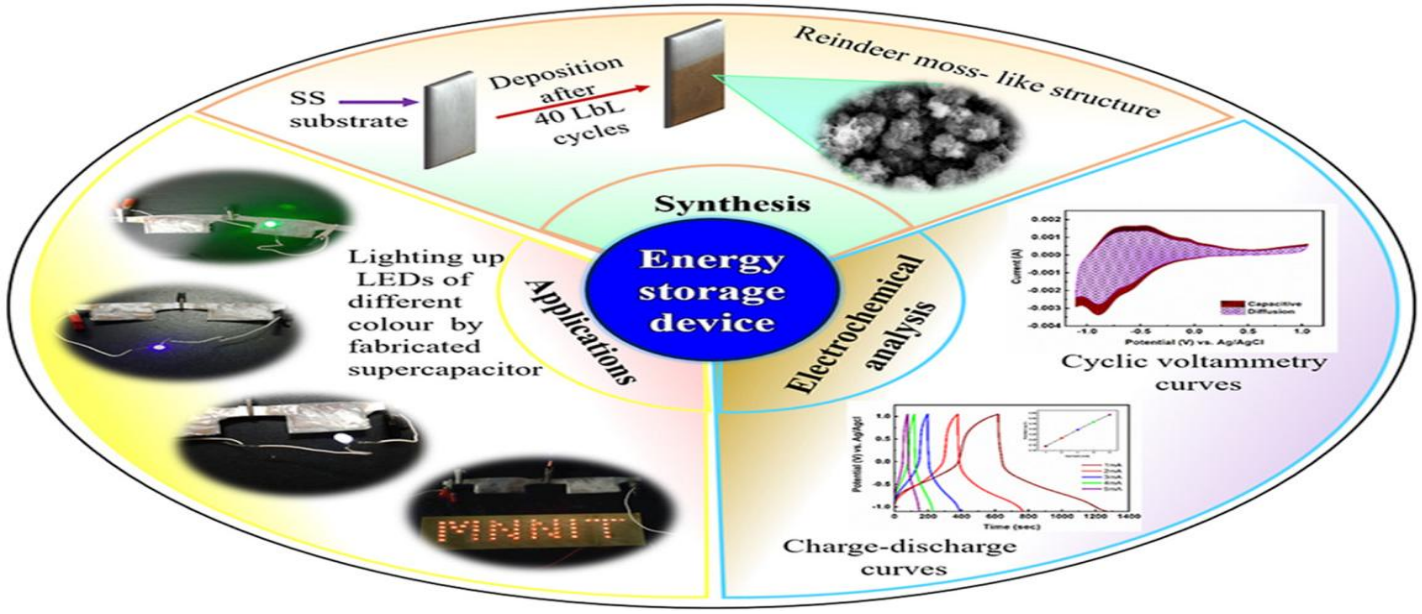
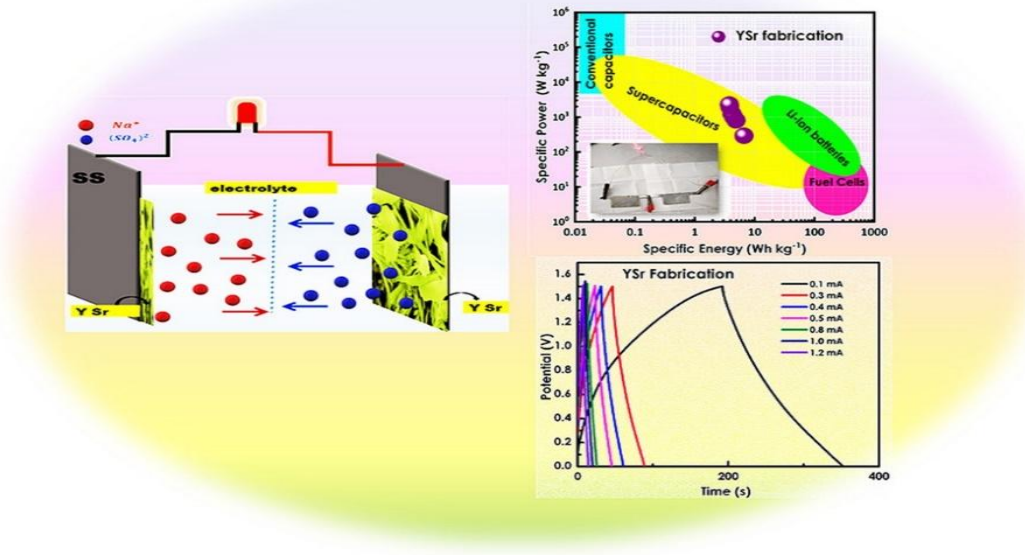
- Nanomaterials for energy storage, Supercapacitor and device fabrication
- Nanostructured thin film, Functional oxide nanomaterial
- Dynamics of nonlinear and damped systems, Symmetry and integrability, Fractal and multi-fractal analysis, Quantum computing: Entanglement dynamics
- Research Area/Focus 3



Energy, 224, 2021, 120137 (1-12)



Energy, 197, 2020, 117163 (1-12)

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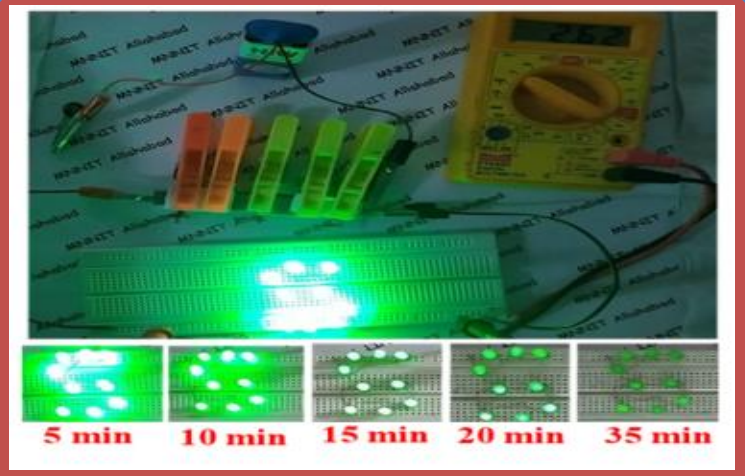
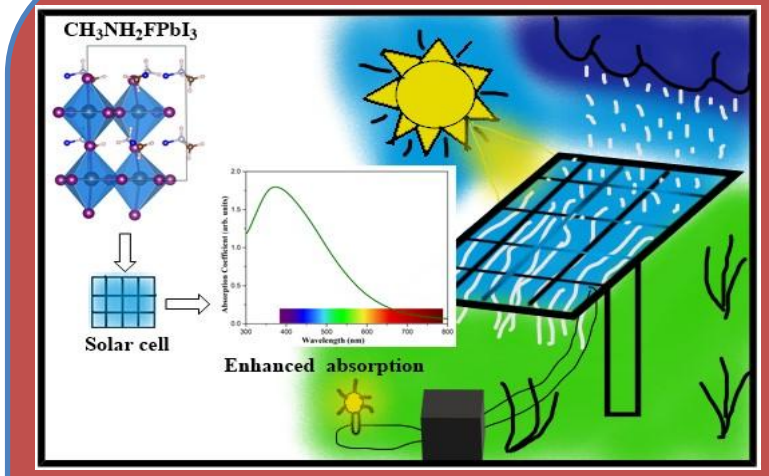
- **Development of Efficient Materials for Energy Storage and Photo-catalytic Applications/ Focus 1**
- **Designing of Organic Inorganic Hybrid Perovskite Materials for Solar Energy Harvesting / Focus 2**
- **Development of Materials for Resistive Switching Applications / Focus 3**



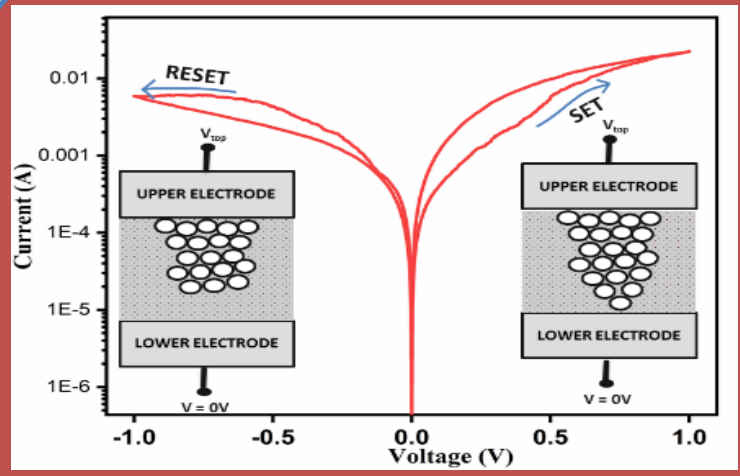
Application 1

J. Colloid Interface Sci.
580 (2020) 720 [IF=8.12]



Application 2

J. Phys. Chem. C
123 (2019) 13385 [IF=4.12]



Application 3

Chem. Phys.
538 (2020) 110900 [IF=2.34]

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PHD, IIT Bombay, India

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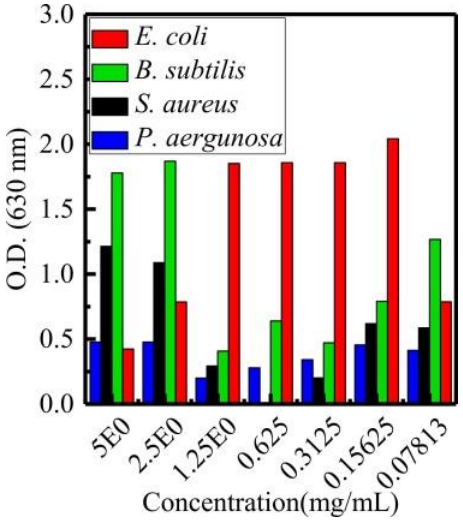
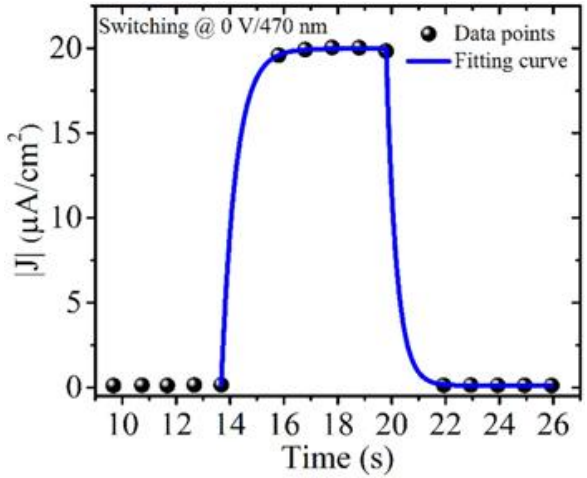
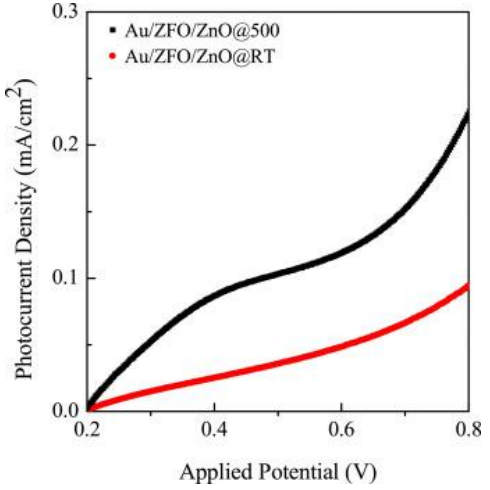
- **Research Area/Focus 1: Nanostructures and thin films of functional oxides.**
- **Research Area/Focus 2: Growth of thin films using pulsed laser deposition and Sputtering.**
- **Research Area/Focus 3: Applications of functional oxides (Gas sensing, biosensing, antibacterial activity, energy and spintronics, photodiodes, photoelectrochemical etc.)**



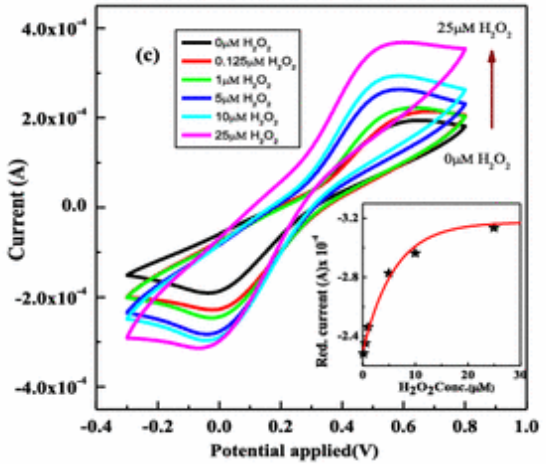
Application 1: Antibacterial activity of PANI coated $CoFe_2O_4$ nanocomposite for gram-positive and gram-negative bacterial strains [*Materials Today Communications*, 31,103229 (2022)]



Application 2: Rise and decay time of P3HT-MoS_2 self-powered photodetector at zero bias under 470 nm illumination. [*Nanotechnology* **32** 385201 (2021)]



Application 3: Photoelectrochemical performances of Au/ $ZnFe_2O_4$/ ZnO@RT and Au/ZF_2O_4/ZnO@500. [*Thin Solid* Films, 709, (1), 138227 (2020)]



Application 4: H_2O_2 sensing using HRP modified catalyst-free ZnO nanorods synthesized by RF sputtering. [*Applied Physics A* 123(6) , 453 (2017)]

Experimental Condensed Matter Physics: Functional oxide materials (bulk, nanostructures and thin films)

Dr. Ravi Prakash

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Assistant Professor, Department of Physics, MNNIT Allahabad
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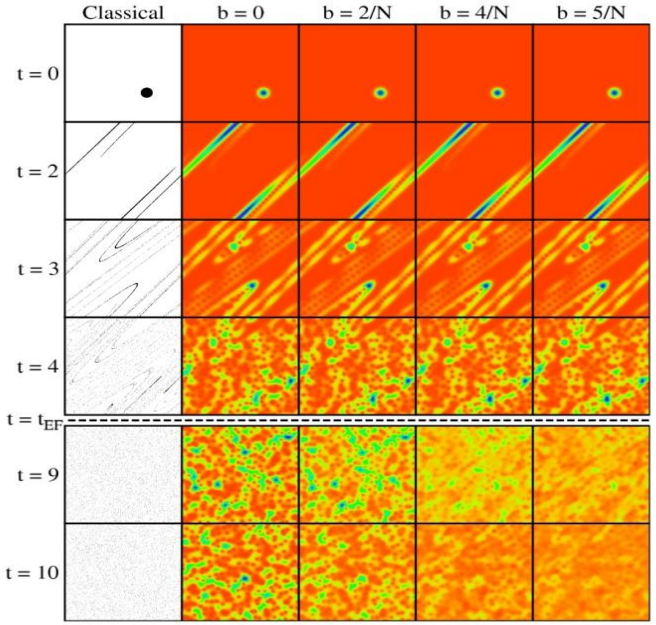
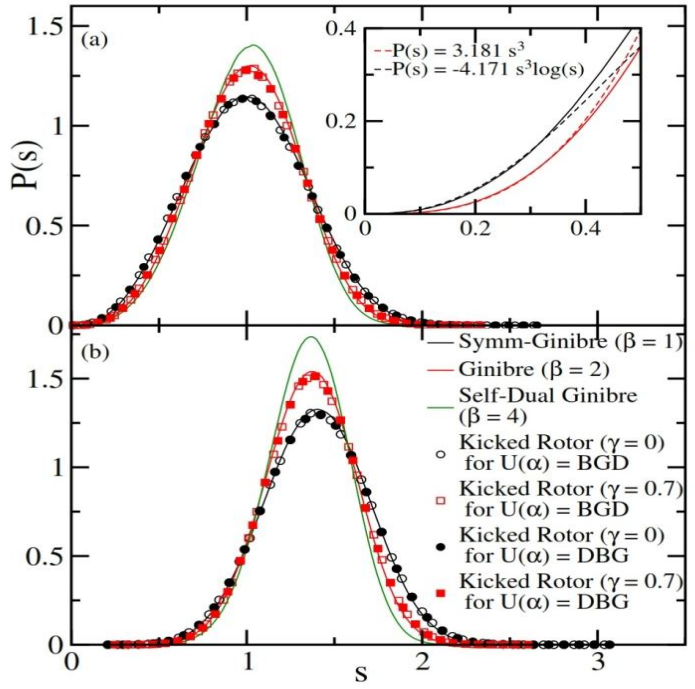
Research Interests

Quantum chaos, Random matrix theory and its applications, Embedded ensembles of random matrices, Dissipative/open quantum systems, Nonlinear dynamics and complex systems, Quantum entanglement, Out-of-time-order-correlators. Entanglement entropy and operator entanglement.



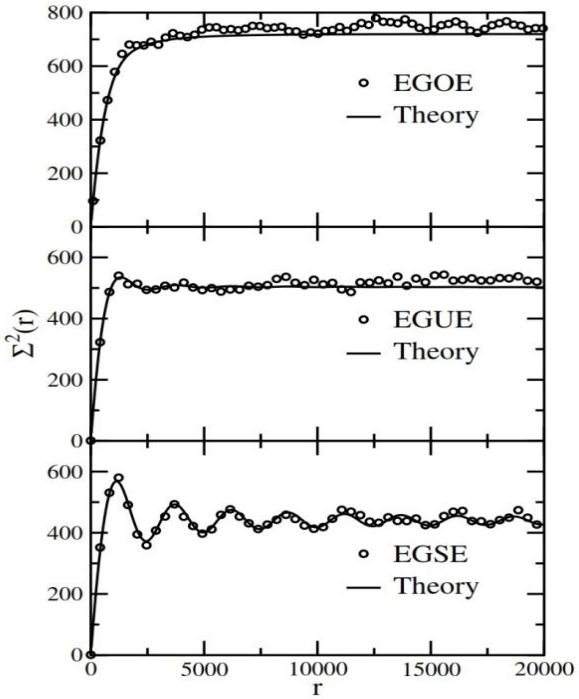
Phase-space representations of initially localized time-evolving states for a weakly coupled bipartite system consist of strongly chaotic kicked rotors as subsystems. For such systems, the Ehrenfest time separates regime of intra-subsystem and inter-subsystem scrambling. The scrambling is intra-subsystem upto the Ehrenfest time, and therefore is independent of coupling (b). After the Ehrenfest time, it is of inter-subsystem type and therefore depends on coupling.

– Phys. Rev. B, **101**, 121108(R) (2020).



Nearest neighbour and next nearest neighbour spacing distribution are shown in (a) and (b) respectively for symm-Ginibre ($\beta = 1$), Ginibre ($\beta = 2$) and self-dual Ginibre ($\beta = 4$) ensembles of random matrices. Also shown in the plots, their excellent agreement with dissipative kicked rotors corresponding to time-reversal invariant ($\beta = 1$) and time reversal ($\beta = 2$) case.

– Europhys. Lett., **127**, 30004 (2019).



Number variance static for embedded ensembles of two non-interacting particle systems. The sub-systems are represented by GOE, GUE and GSE of random matrices in top, middle and bottom plot respectively. The saturation in all plots represents the suppression of fluctuations with large correlation lengths.

– Phys. Rev. E, **93**, 052225 (2016).

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- **Financial Derivatives**
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Pricing Efficiency in CNX Nifty Index Options Using the Black–Scholes Model: A Comparative Study of Alternate Volatility Measures

Tanuj Nandan, Puja Agrawal

First Published March 21, 2016 | Research Article |

https://doi.org/10.1177/0973801015625390

Article information

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Tanuj Nandan; Vikas Kumar Choubey

DOI: 10.1504/IJISE.2019.096884

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- **E-government**
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Towards adoption of Green IS: A literature review using classification methodology

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[b] School of Management Studies, Motilal Nehru National Institute of Technology, Allahabad, 211004 Uttar Pradesh, India

ARTICLE INFO

Keywords:
Green information systems
Green IT
Systematic literature review
Environment sustainability
Green IS adoption

ABSTRACT

Green Information Systems (Green IS) emerged as a crucial area for research to reduce organizations/society's carbon footprints and consequently, to achieve environment sustainability. This research paper provides an extensive systematic literature review in Green IS area to facilitate advance research in the area. The aim of the paper is to provide basic understanding of Green IS and to highlight the significant research conducted earlier in this area. Classification approach adopted to conduct the study, and the research area categorized under five segments namely: Green IS concept, innovation and technology, impact of green initiatives, measures and policies, and global context. These five categories were further divided into subcategories to provide in-depth and crystal clear review of literature. Accessible research articles, book chapters and reports from top ten databases Emerald, Science Direct, EBSCOhost, ACM digital Library, IEEE, JSTOR, ProQuest, Sage, Wiley online and Springer link were reviewed. Research propositions are provided for future significant research in this area.

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An innovation resistance theory perspective on mobile payment solutions

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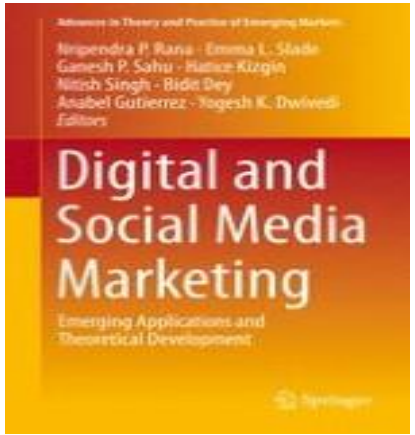
ARTICLE INFO

Keywords:
Consumer behavior
Innovation resistance theory (IRT)
Intentions to recommend
Mobile payments
Resistance
Use intention

ABSTRACT

Mobile payment solutions (MPSs) are experiencing growth and popularity across the globe because of their convenience and other benefits in performing transactions. However, despite these circumstances and the benefits offered, MPSs are still suffering from challenging situations related to their adoption and usage. The main challenge MPSs have faced in retail is because of the presence of consumer resistance toward their use. The present study investigates the different consumer barriers toward the intentions to use and recommend MPSs. The current study examines the adoption and usage of MPSs through the lens of innovation resistance. We developed the research model based on the innovation resistance theory (IRT) and tested it using a large cross-sectional study with 1256 MPS users. The study findings suggest that usage, risk, and value barriers are negatively associated with intentions to use MPSs. On the other hand, only usage and value barriers have a negative association with users' intention to recommend MPSs. In comparison, the tradition and image barriers did not share any association with the user intentions. The study offers different implications for practitioners and researchers.



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Artificial intelligence adoption in the insurance industry: Evidence using the technology–organization–environment framework

Somya Gupta[a], Wafa Ghardallou[b], Dharen Kumar Pandey[c,*], Ganesh P. Sahu[a]

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ARTICLE INFO

JEL Classification:
G22
O32

Keywords:
Artificial intelligence
Insurance industry
TOE framework
Structural equation modeling
InsurTech

ABSTRACT

Using the technology–organization–environment framework, this study examines the factors influencing the behavioral intention of insurance industry employees to adopt artificial intelligence (AI)-enabled applications. With two factors from the technology dimension and three factors each from the organization and environment dimensions, we collected data from 358 employees in the Indian insurance industry. We use structural equation modeling to test what variables significantly impact employees' behavioral intentions to adopt AI in the insurance industry. While all technological (relative advantage and complexity) and environmental (market dynamics, regulatory support, and competitive pressure) variables significantly predict behavioral intention, only top management support and financial readiness among the environmental variables indicate a significant association with the behavioral intention for AI adoption. Accordingly, technical competencies did not have a significant impact on behavioral intention.

Fig. 3. Literature Review Process and Classification Mapping.

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Sailing through the COVID-19 pandemic: managing expatriates' psychological well-being and performance during natural crises

Chhaya Mani Tripathi and Tripti Singh

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Received 31 March 2021
Revised 14 July 2021
24 August 2021
Accepted 10 October 2021

Abstract

Purpose – The unprecedented challenges brought about by the coronavirus (COVID-19) pandemic affected people's lives worldwide. The purpose of this study is to propose a conceptual model to explain how natural crisis events, such as COVID-19, cause stress and influence the psychological well-being (PWB) and performance of expatriates.

Design/methodology/approach – The model presented in this conceptual paper is based on Bader and Berg's (2014) two-stage stress emergence and outcome model developed to study expatriates' performance in terrorism-endangered countries. The authors apply their model to natural crisis events and provide propositions to explain the postulated relationships.

Findings – The proposed model delineates the stressors that emerge from psychological and situational factors, and how they impact the PWB and performance of expatriates. The article emphasizes how resilience, social network, and support from the organization, supervisor, and family can help mitigate the adverse effects of stress on the PWB of expatriates. Furthermore, keeping in mind the prevailing situations due to COVID-19, the authors shed light on the indispensability of virtual collaboration in ameliorating expatriates' performance in challenging times.

Practical implications – Implications are discussed for organizations in devising plans and strategies to deal with unforeseen crisis events.

Originality/value – This study extends the expatriation literature to the events of natural crisis by incorporating the stress emergence-outcome model. In doing so, the authors identify the factors relevant to natural crises and apply them to understand how they could impact expatriates in such times.

Keywords Natural crisis, COVID-19, Stressors, Expatriate performance, Psychological well-being

Paper type Conceptual paper

The current issue and full text archive of this journal is available on Emerald Insight at:
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BIJ
29,8

2450

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1 October 2021
Accepted 13 October 2021

Modelling the role of social media usage in improving users well-being: a social enhancement model perspective

Rahul Bodhi, Tripti Singh and Yatish Joshi

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Abstract

Purpose – Employees have gradually adopted social media sites and their applications that have been associated with enhanced communication and collaboration at the workplace. However, social technologies have both positive as well as negative consequences. The current study examines the impact of loneliness on employees' psychological well-being (PW); subsequently, the mediating role of social media use intensity (SMI) at the workplace. It also examines the moderating role of gender and management status of employees.

Design/methodology/approach – The present study conducted an online and offline survey using a cross-sectional design. Data were collected from 206 working professionals from the IT industry in India. Structural equation modelling was applied to analyse data.

Findings – Results revealed that employee loneliness is positively associated with SMI. Employee's SMI was positively associated with enhanced PW. Unexpectedly, employee loneliness is positively and significantly related to PW. However, the moderating roles of gender and management status of employees were not supported.

Practical implications – The current study can help managers, policymakers and organizations better understand the role of employee social media use in the workplace. Using the insights and understanding offered by the study, social media can be effectively utilized in the workplace. The study recommends that organizations may allow the use of social media at the workplace. Social media resources may also be helpful in improving employee communication and digital literacy.

Originality/value – The current study is a pioneer work and contributes to the literature by examining the relationship between loneliness, SMI and PW. This study has essential theoretical and managerial contributions.

Keywords Social enhancement model, Loneliness, Psychological well-being, Employee, Workplace, Social media

Paper type Research paper

1. Introduction

Social media have transformed the very nature of communication with rapid expansion and widespread application (Cao and Yu, 2019; Chang and Hsiao, 2014). Social media is defined as "a set of mobile and web-based platforms" that radically changed the way people interact, share information, express views, collaborate and build networks (Giannakis *et al.*, 2020; Ouirdi *et al.*, 2014; Ray *et al.*, 2021; Yadav and Rahman, 2018). Social media users stand at nearly 4.33 billion globally, and the penetration level is approximately 55% (Digital Report, 2021). A recent report is revealed that 41% of employees had adopted social media for work purposes globally (Digital Report, 2021). Social media are gradually becoming ubiquitous at the workplace (El Ouirdi *et al.*, 2015). van Zoonen *et al.* (2016) stated that social media applications and site usages for work and organizational purposes refer to the content shared related to work experience, and organizational or industry-related information.

Organizations and employees extensively use social media for work-related and non-work-related purposes (Zhang *et al.*, 2019a). In the recent past, most studies have focussed on the general use of social media, such as adolescents and young adults (e.g. Faelens *et al.*, 2021).

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Worker participation in union activities: a conceptual review

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Abstract

Purpose – Viewed in the context of liberalization, privatization and globalization, the socio-economic and legal environment facing the unions have changed, throwing them into clutches of adversity and destitution. The purpose of this paper is to identify the reasons (i.e. antecedents) behind workers' participation in union activities (such as strikes, rallies, demonstrations) in today's scenario, and to understand how these participation tactics influence workers' performance (i.e. worker behavior effectiveness) at work.

Design/methodology/approach – A range of published sources is drawn on, including quantitative, survey based and qualitative, case-study and other evidence for building the conceptual review.

Findings – The investigation clearly indicates that contemporary challenges facing unions in the present scenario prompt industrial actions. Only specific and genuine grievances and justifiable demands motivate workers to form a strong emotional attachment to their unions and engage in union participation activities such as strike activity (Darlington, 2006; Bean and Stoney, 1986).

Originality/value – Contrary to the traditional view, which sights unions as detrimental to worker productivity, turnover, and attendance at work (via restrictive work rules, featherbedding and disruptive strikes or other adversarial tactics), the investigation, through extensive review of literature proposes that unions positively influence worker behavior at work. The model, however, requires empirical testing to validate the proposed relationships.

Keywords Qualitative, Trade unions, Conceptual model, Antecedents of union participation, Union participation, Worker behaviour effectiveness

Paper type Conceptual paper

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- Consumer Behaviour
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Direct and Moderating Influence of Perceived Fit, Risk and Parent Brand Trust on Brand Extension Success of a Personal Care Brand in India

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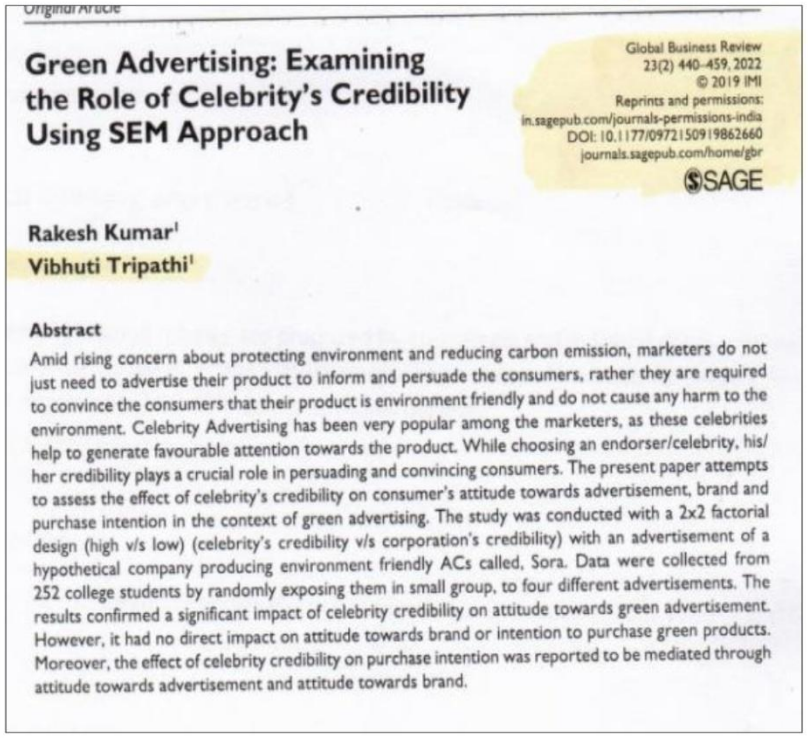
Vibhuti Tripathi[1]
Pooja Rastogi[2]
Suresh Kumar[1]

Abstract

The shifting market dynamics and harsh rivalry of the worldwide economy have augmented the role of brands to an incomparable level. Brand extension has emerged as a popular strategy in the marketing area. While it brings brands closer to success, it is also imperative and important to understand how consumers evaluate and presume similar or dissimilar extensions and what is the substantial influence of risk and subsistence of parent brand on extension success? Identifying and analysing such relationships could be helpful and important for personal care brands in India to gain an edge over competitors. Data were collected from 500 consumers who were proverbial with the brand extensions of Dettol in similar or dissimilar product categories. Regression analysis showed that though perceived fit and risk directly influence the success of brand extension, nevertheless on incorporating parent brand conviction as a moderator the relationships between perceived fit and brand extension success and risk and brand extension success are strengthened. Limitations and future scope have also been mentioned.

Keywords

Brand extension, perceived fit, risk, parent brand trust, personal care brands, Dettol



Original Article

Green Advertising: Examining the Role of Celebrity's Credibility Using SEM Approach

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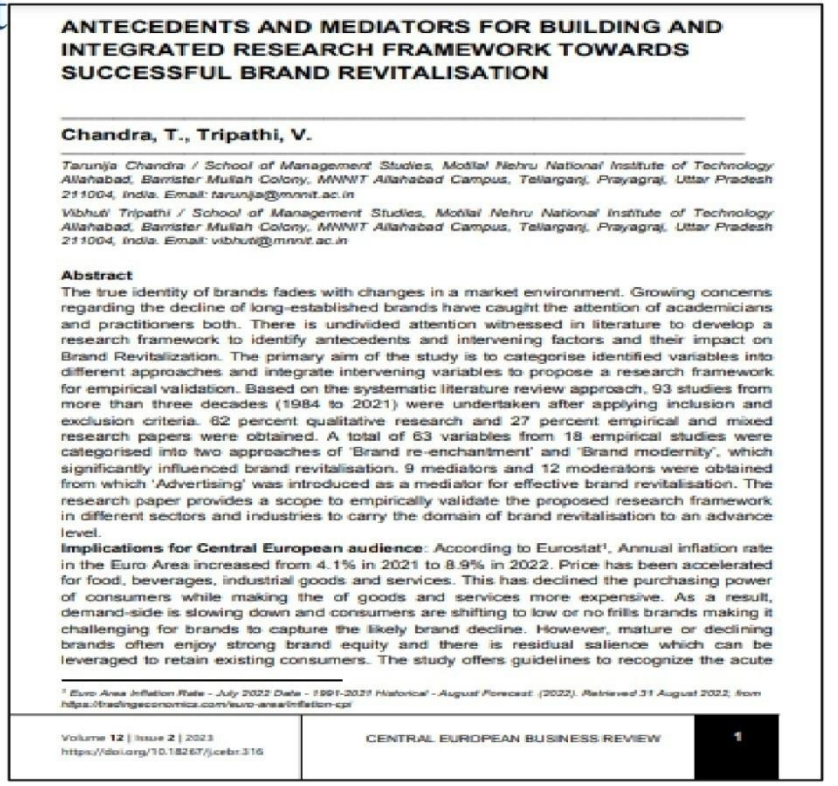
SAGE

Rakesh Kumar[1]
Vibhuti Tripathi[1]

Abstract

Amid rising concern about protecting environment and reducing carbon emission, marketers do not just need to advertise their product to inform and persuade the consumers, rather they are required to convince the consumers that their product is environment friendly and do not cause any harm to the environment. Celebrity Advertising has been very popular among the marketers, as these celebrities help to generate favourable attention towards the product. While choosing an endorser/celebrity, his/her credibility plays a crucial role in persuading and convincing consumers. The present paper attempts to assess the effect of celebrity's credibility on consumer's attitude towards advertisement, brand and purchase intention in the context of green advertising. The study was conducted with a 2x2 factorial design (high v/s low) (celebrity's credibility v/s corporation's credibility) with an advertisement of a hypothetical company producing environment friendly ACs called, Sora. Data were collected from 252 college students by randomly exposing them in small group, to four different advertisements. The results confirmed a significant impact of celebrity credibility on attitude towards green advertisement. However, it had no direct impact on attitude towards brand or intention to purchase green products. Moreover, the effect of celebrity credibility on purchase intention was reported to be mediated through attitude towards advertisement and attitude towards brand.



ANTECEDENTS AND MEDIATORS FOR BUILDING AND INTEGRATED RESEARCH FRAMEWORK TOWARDS SUCCESSFUL BRAND REVITALISATION

Chandra, T., Tripathi, V.

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Abstract

The true identity of brands fades with changes in a market environment. Growing concerns regarding the decline of long-established brands have caught the attention of academicians and practitioners both. There is undivided attention witnessed in literature to develop a research framework to identify antecedents and intervening factors and their impact on Brand Revitalization. The primary aim of the study is to categorise identified variables into different approaches and integrate intervening variables to propose a research framework for empirical validation. Based on the systematic literature review approach, 93 studies from more than three decades (1984 to 2021) were undertaken after applying inclusion and exclusion criteria. 62 percent qualitative research and 27 percent empirical and mixed research papers were obtained. A total of 63 variables from 18 empirical studies were categorised into two approaches of 'Brand re-enchantment' and 'Brand modernity', which significantly influenced brand revitalisation. 9 mediators and 12 moderators were obtained from which 'Advertising' was introduced as a mediator for effective brand revitalisation. The research paper provides a scope to empirically validate the proposed research framework in different sectors and industries to carry the domain of brand revitalisation to an advance level.

Implications for Central European audience: According to Eurostat[1], Annual inflation rate in the Euro Area increased from 4.1% in 2021 to 8.9% in 2022. Price has been accelerated for food, beverages, industrial goods and services. This has declined the purchasing power of consumers while making the of goods and services more expensive. As a result, demand-side is slowing down and consumers are shifting to low or no frills brands making it challenging for brands to capture the likely brand decline. However, mature or declining brands often enjoy strong brand equity and there is residual salience which can be leveraged to retain existing consumers. The study offers guidelines to recognize the acute

[1] *Euro Area Inflation Rate - July 2022 Data - 1991-2021 Historical - August Forecast. (2022). Retrieved 31 August 2022, from https://tradingeconomics.com/euro-area/inflation-cpi*

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Relationship of Manufacturing Flexibility with Organizational Strategy

Somen Dey, R. R. K. Sharma & Balbir Kumar Pandey

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Abstract

Issues on environmental sustainability in every developmental activities of human civilization are the prime concern for all the stakeholders associated with the events. The idea of implementing green initiatives is an effort to attain longterm

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- **Sustainable Consumption**
- **Green Products Marketing**
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Investigating consumers' green purchase intention: Examining the role of economic value, emotional value and perceived marketplace influence

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ABSTRACT

The consumption pattern of people can be an efficient way to deal with the deteriorating situation of nature, which has adversely impacted human health and wellbeing. The current study investigates consumers' green purchase intention by examining psychological factors such as economic value, emotional value, and perceived marketplace influence. A total of 387 responses was obtained and analyzed using structural equation modeling. Findings suggested that emotional value, perceived marketplace influence, subjective norm, and attitude are key predictors of consumers' green purchase intention. Incorporating psychological factors such as economic value, emotional value, and perceived marketplace influence in the TPB model increased the predictive power for intentions to adopt green products. This study explores the relationship between perceived marketplace influence and attitude towards purchasing green products by demonstrating that one's impression of influence over others' marketplace behaviour has a considerable impact on one's marketplace behaviour. When consumers believe

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The interplay of emotional value, trend affinity and past practices in sustainable consumption: an application of theory of reciprocal determinism

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ABSTRACT

This study aims to examine the role of trend affinity, emotional value, and past sustainable practices on consumers' sustainable consumption behaviour. The research employed a survey approach to collect responses; 282 usable responses were received. Results established trend affinity, emotional value, and supportive behaviour towards environmental organisations as significant determinants of individuals' sustainable consumption practices. Using Theory of Reciprocal Determinism (TRD) framework and integrating personal, behavioural and social factors, the study provides a novel perspective to understand sustainable consumption behaviour. Policymakers and practitioners can use the outcome of the study to promote sustainable consumption behaviour among individuals to minimise damage to the environment.

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Sustainable consumption behaviour; trend affinity; emotional value; social influence; perceived consumer effectiveness

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2021, Vol 25, Research on consumer evaluation of mobile applications

Does gamified interaction build a strong consumer-brand connection? A study of mobile applications

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Abstract

In recent times gamification has increasingly been used by brands through smartphones to interact effectively with their consumers. The core assumption for creating gamified environment is that it will develop engagement with the consumer and motivate them to use their product or services. However, beyond this assumption, there is dearth empirical evidence regarding how much effective these gamified features are in engaging consumers. Therefore, this research analyses the relationship between flow, brand engagement, self-brand connection and brand usage intent among consumers (N = 360) of two gamified mobile applications. The findings show that the multidimensional construct flow formed by five dimensions i.e. challenge, feedback, autonomy, immersion, and interaction positively associates with cognitive brand engagement and emotional brand engagement. Additionally, both these forms of brand engagement further strengthen consumers' brand connection and motivate them for further use. These results imply that gamified environment can augment consumer engagement with brand and further increase usage intention. Therefore, gamification can be an effective technique in brand management and brand managers can use it to strengthen relationship with consumers and increasing possibility of using their brands.

Keywords: Gamification; Smartphone applications; Flow; Consumer brand engagement; Brand usage intent; Self-Brand connection

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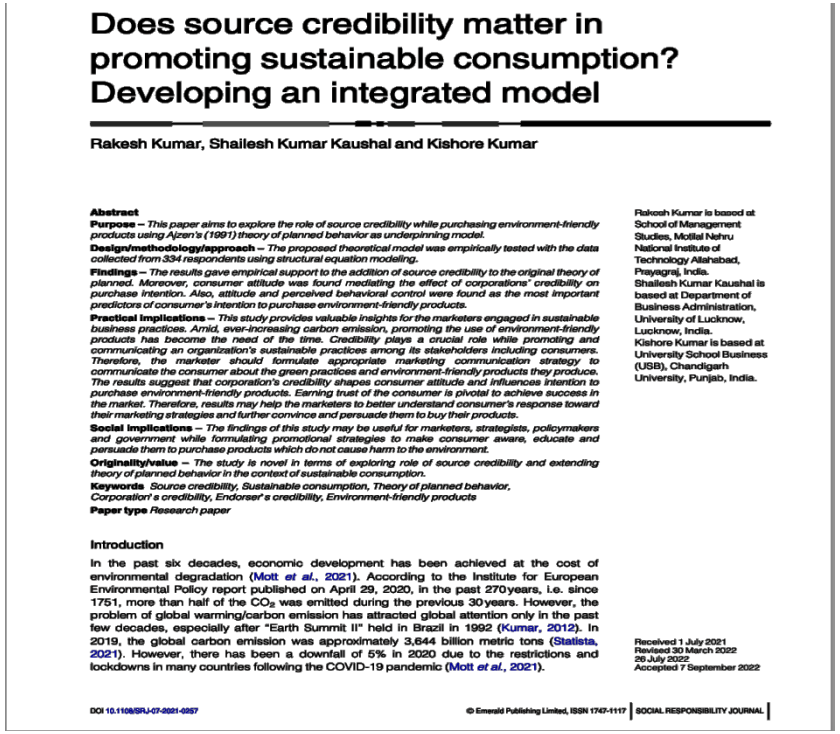
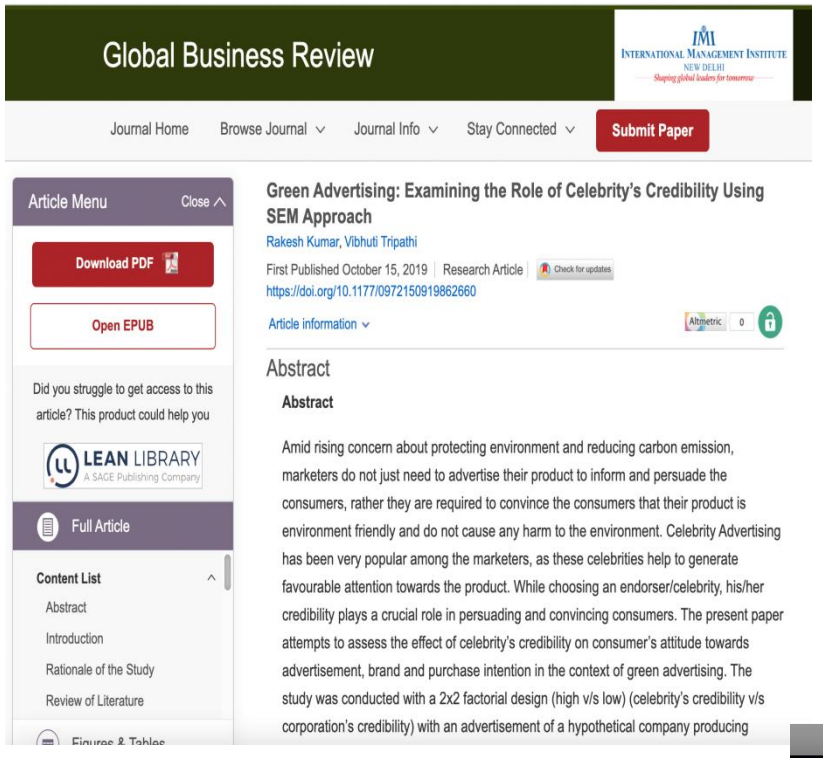


Does source credibility matter in promoting sustainable consumption? Developing an integrated model

Rakesh Kumar, Shailesh Kumar Kaushal and Kishore Kumar



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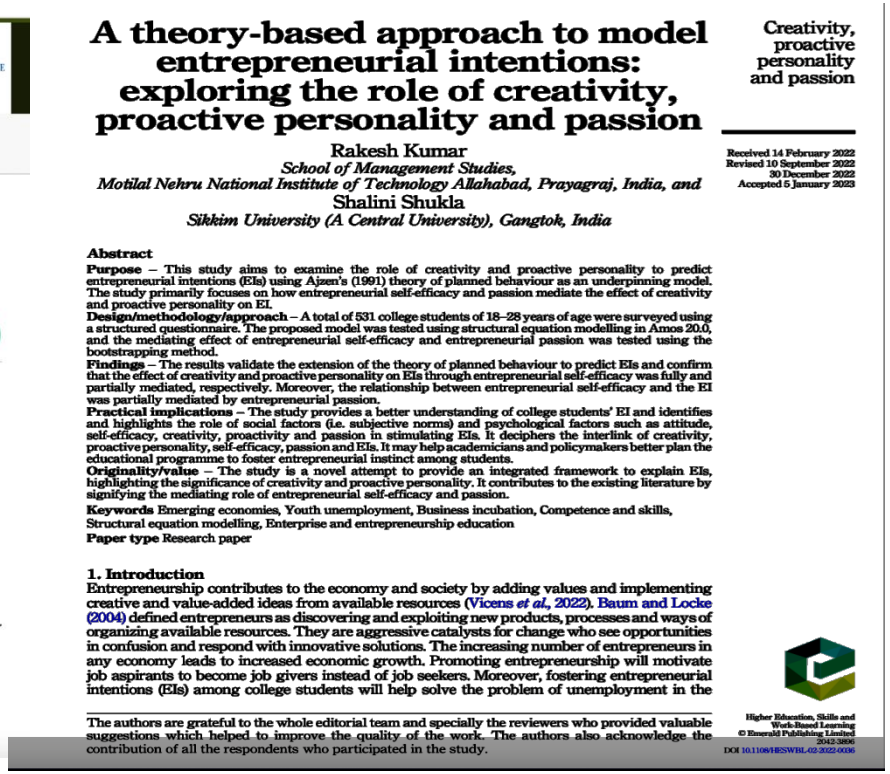

A theory-based approach to model entrepreneurial intentions: exploring the role of creativity, proactive personality and passion

Rakesh Kumar

Shalini Shukla