

Ongoing Externally Funded Research Projects (2020)



PROJECT -1. Principal Investigator: Dr. Avind Mittal

Co- Principal Investigator: Dr. A. Oja, Dr R.M. Sarviya

Project title: Performance Investigation of Grid Connected Micro Multilevel Inverter Based Solar Photovoltaic System

Funding Agency: Science and Engineering Research Board (SERB), GOI

Sanctioned Amount: Rs. 4675000.00

“This research facility will be helpful to investigate some air circulation techniques inside the cold storage which will be helpful to improve the performance of cold storage”

PROJECT -2. Principal Investigator: Dr. Rajnish Kurchania

Project title: Development of Novel Bismuth (Bi) based double perovskite multiferroic ceramics for device applications

Funding Agency: Science and Engineering Research Board (SERB), DST

Sanctioned Amount: Rs. 4832520.00

“Optimization of processing parameters for the synthesis of Bi based double perovskite multiferroic materials ($Bi_2BB'O_6$ where B and B' are transition metals Fe, Ni, Mn, Cr, Re) using different synthesis techniques. Investigate the phase formation, structural, electrical (ferroelectric, dielectric, piezoelectric) and magnetic properties of Bi based double perovskite multiferroic materials. Study the rare earth substituted Bi based double perovskite ceramics for the effect of rare earth (RE) substitution at A site or B site on its ferroelectric and magnetic properties for their potential applications in magnetoelectric devices”.

PROJECT -3. Principal Investigator: Puneet K Singh

Co- Principal Investigator: Pankaj Shrivastav and C.M.Krishna

Project title: Design, Development and Fabrication of Silicon Rubber Colonoscope for Maximum Comfort

Funding Agency: National Project Implementation Unit

Sanctioned amount: 1700000.00

“The project concerns with performance improvement of solar air heater using artificial roughness. Performance of solar air heater is poor due to formation of laminar sub-layer on



absorber plate surface. This layer retards flow of heat from absorber plate. The laminar sub-layer can be broken that can lead to increase in heat transfer. Laminar sub-layer can be broken using artificial roughness. Research work involves finding roughness geometry that is better than existing ones based on thermo-hydraulic performance criteria. For this research work involves fabrication of experimental set-up and procurement of instruments for data collection. Experimental data will be analysed to comprehend effectiveness of roughness geometry.”

2

PROJECT -4. Principal Investigator: Dr. Vaibhav Koutu

Co-Principal Investigator: Dr. P. P. Bansod, Dr. M. M. Malik, Dr. Yogesh Kumar Sariya

Project Title: Biological synthesis of metal-oxide nanoparticles using natural components as NMS for anticancer applications

Funding Agency: TEQIP

Sanctioned Amount: Rs. 1160000.00

“Biological synthesis of metal-oxide nanoparticles using wet chemical synthesis route using natural components of plants and herbs as the synthesis base material.”

PROJECT -5. Principal Investigator: Piyush Kumar Jain

Co-Principal Investigator: Dr. Atul Lanjewar, Dr. Kunj Bihari Rana

Project Title: Performance improvement of solar air heater using artificial roughness and analyze its effectiveness

Funding Agency: TEQIP

Sanctioned Amount: Rs. 762000.00

“The project concerns with performance improvement of solar air heater using artificial roughness. Performance of solar air heater is poor due to formation of laminar sub-layer on absorber plate surface. This layer retards flow of heat from absorber plate. The laminar sub-layer can be broken that can lead to increase in heat transfer. Laminar sub-layer can be broken using artificial roughness. Research work involves finding roughness geometry that is better than existing ones based on thermo-hydraulic performance criteria . For this research work involves fabrication of experimental set-up and procurement of instruments for data collection. Experimental data will be analysed to comprehend effectiveness of roughness geometry.”

PROJECT -6. Principal Investigator: Dr. K R Aharwal



Project Title: Development of the experimental research facility to improve the performance of cold storage

Funding Agency: Department of Science and Technology Govt of India New Delhi

Sanctioned Amount: Rs. 1930000.00

PROJECT -7. Principal Investigator: Dr. Manoj Arya

Co-Principal Investigator: Dr. Manish Vishwakarma

Funding Agency: DST-NIMAT 2019-20

Sanctioned Amount: 1250000.00

“Organized training programs for faculties, women, science and technology graduates based on technology specific programs to promote entrepreneurs. Entrepreneurship awareness camps for undergraduates were organised.”

PROJECT -8. Principal Investigator: Prof. Manoj Pant

Co-Principal Investigator: Dr. Akhilesh Barve

Project Title: Assessing the Logistics Cost Competitiveness and the Impact of Zero Liquid Discharge (ZLD) Norm on the Livelihood Patterns and Health Conditions of the Knit-wear Capital of India: A study on Tirupur Textile Cluster

Funding Agency: Indian Council of Social Science Research New Delhi

Sanctioned Amount: Rs. 1200000.00

“A study on Tirupur Textile Cluster for Assessing the Logistics Cost Competitiveness and the Impact of Zero Liquid Discharge (ZLD) Norm on the Livelihood Patterns and Health Conditions of the Knit-wear Capital of India”

PROJECT -9. Principal Investigator: Dr. R.K. Nayak

Co-Principal Investigator: Dr. R.K. Paramguru

Project Title: Sand-less Casting Process

Funding Agency: DST and RSB Metal Tech Pvt Ltd.

Sanctioned Amount: Rs. 2495000.00

"This project aims to develop green sand mould casting using industrial waste to replace pure silica sand partially or fully."



PROJECT -10. Principal Investigator: Dr S Suresh

Co-Principal Investigator: Dr C Sasikumar

Project Title: Process optimization using indigenously developed plasma assisted photo-catalytic reactor and regeneration of catalysts

Funding Agency: ONGC-Energy Centre, New Delhi

Sanctioned Amount: Rs. 1063000.00

"A novel process and catalysts material is being developed to convert CO2 into fuel"

PROJECT -11. Principal Investigator: Dr Sanjay Srivastava

Co-Principal Investigator: Dr C Sasikumar, Dr S Das

Project Title: Analysis and Investigation of Indian Climate Atmospheric Effect on Corrosion of Galvanized Steel Sheets

Funding Agency: Panasonic India Pvt Ltd., Gurgaon, Haryana -122002

Sanctioned Amount: Rs. 3050000.00

"Investigating the corrosion behaviour of the metals to be used for Making A/c under Indian climate"

PROJECT -12. Principal Investigator: Dr R.K. Pateriya

Co-Principal Investigator: Dr Deepak Singh Tomar

Project Title: Information Security Education and Awareness Project

Funding Agency: Department of Electronics and Information Technology, Ministry of Communication and Information Technology, Govt. of India

Sanctioned Amount: Rs. 4000000.00

"To support, promote, and launch a national public service campaign on cyber security. To develop an open source cyber security tool kit"



PROJECT -13. Principal Investigator: Dr D.R. Sahu



Co-Principal Investigator: Dr Deepak Singh Tomar

Project Title: Development of IoT Device for Security Auditing of Web Applications

Funding Agency: TEQIP Collaborative Research Scheme, National Project Implementation Unit, Govt. of India.

Sanctioned Amount: Rs. 1054000.00

PROJECT -14. Principal Investigator: Dr Rajesh Wadhvani

Co-Principal Investigator: Dr Sanyam Shukla

Project Title: Long Short Term Memory Neural Network based Model for Solar Irradiance Forecasting.

Funding Agency: Madhya Pradesh Council of Science and Technology.

Sanctioned Amount: Rs. 460000.00

“Analysis of solar irradiance and its forecasting for a given location has a significant impact on the generation of power systems. The traditional computational methods for irradiance forecasting have low prediction accuracy, low scalability for big data, and inability to capture long-term dependencies. So, the aim is to develop a model for reliable forecast of solar parameters that can be used for energy planning and decision making process. The results of our study can help to find potential areas of interest for solar generation deployment in a cost effective manner.”

PROJECT -15. Principal Investigator: Dr Mitul Ahirwal

Project Title: development of computational model for decision making based on emotion recognition through EEG signal

Funding Agency: SERB, New Delhi

Sanctioned Amount: Rs. 1154160.00

“In this project, a computational model of decision making has been developed, that works on the basis of implicit tagging based on emotion recognition. To fulfill aim of this project, an emotion recognition system and concept of implicit (unconscious) decision making is mapped. For this audio/visual stimulation are used to generate different emotions. Electroencephalogram (EEG) signals have been classified to identify the emotions. This project can also be extended to control over the emotional pollution generated by the mass media in Indian society.”

PROJECT -16. Principal Investigator: Dr. Vijay Bhaskar Semwal



Project Title: Development of Computational model for bipedal walking trajectories generation and analysis of different gait abnormality

Funding Agency: SERB-DST

Sanctioned Amount: Rs. 2100000.00

“Design of computational for bipedal robot walking trajectories generation”

PROJECT -17. Principal Investigator: Dr Salim Qureshi

Co-Principal Investigator: Dr Pushendra Singh & Dr. Pankaj Swarnkar

Project Title: Intelligent Control Techniques for Robotic Manipulator in the Application of Robotic Assisted Surgery”

Funding Agency: TEQIP Collaborative Research Scheme of National project implementation unit of MHRD

Sanctioned Amount: Rs. 1437000.00

“Development of AI based control technique for robotic manipulator for RAS”

PROJECT -18. Principal Investigator: Dr Renuka Kamdar

Co-Principal Investigator: Dr Priyanka Paliwal& Dr Rohit Bhakhar

Project Title: Development of renewable integrated smart micro grid console with intelligent controller

Funding Agency: TEQIP Collaborative Research Scheme of National project implementation unit of MHRD

Sanctioned Amount: Rs. 1732000.00

PROJECT -19. Principal Investigator: Dr Anoop Arya

Co-Principal Investigator: Dr Priyanka Paliwal& Dr Rohit Bhakhar

Project Title: Impact Assessment of renewable energy capacity addition on Indian power sector- Special Emphasis to Solar Power

Funding Agency: Ministry of Electronics & IT, Govt. of INDIA through Digital India Corporation under YFRF of Visvesvaraya Scheme

Sanctioned Amount: Rs. 1500000.00

“The proposed research work analyses central level policies and interventions for renewable energy applications in Rural, Agriculture and Industrial sectors and also recommends a set of guidelines to serve as a roadmap to accelerate the deployment of renewable energy technologies. Also it will help DISCOMs to revise their Renewable Purchase Obligation (RPO) targets in line with the 175 GW of renewable target of GoI so that success in the national level directional shift from conventional to renewable power can be achieved.”

PROJECT -20. Principal Investigator: Dr. Arvind Rajawat

Co-Principal Investigator: Dr. Ajay Somkuwar

Project Title: SMDP Chip to System Design

Funding Agency: Ministry of Electronics and Information Technology

Sanctioned Amount: Rs. 1000000.00

“Design of AES 128 Encryption for FPGA as well ASIC Implementation”

PROJECT -21. Principal Investigator: Dr. Vishnu Prasad

Co-Principal Investigator: Dr. Ruchi Khare & Dr. M.K. Choudhary

Project Title: Impact of Climate Change on Water Resources of Tapi Basin

Funding Agency: Ministry of Water Resources, Govt. of India

Sanctioned Amount: Rs. 2932676.00

“This project is jointly with SVNIT, Surat and MNIT, Jaipur. The effect of climate change on water resources of part of Tapi Basin is to be carried out using downscaling data from GCM and LULC, soil data.”

PROJECT -22. Principal Investigator: Dr. Bablu Kirar

Co-Principal Investigator: Dr. Rajeev Jain & P K Jain

Project Title: Modification of the Engineering Properties of Expansive Soil by using Waste Materials

Funding Agency: CRS Scheme of AICTE/ TEQIP (Grant to SATI, Vidisha)

Sanctioned Amount: Rs.1980000.00

“Various GCLs are commercially available. But their suitability according to the characteristics of the leachates is not known. Hydraulic conductivity for a particular type of leachate will help in the optimal design of the liner system.”

PROJECT -23. Principal Investigator: Dr. P.K.Agrawal



Co-Principal Investigator: Dr. P.K.Jain & Dr. S.Rokade

Project Title: PERFORMANCE EVALUATION OF ROADS IN MP USING COIR

Funding Agency: COIR BOARD

Sanctioned Amount: Rs.7500000.00

“Performance evaluation of roads in MP using coir”

PROJECT -24. Principal Investigator: Dr. Vishnu Prasad

Co-Principal Investigator: Dr. M K Choudhary and Dr. Ruchi Khare

Project Title: Impact of Climate Change on Water Resources of Tapi Basin

Funding Agency: Ministry of Water Resources Govt. of India New Delhi

Sanctioned Amount: Rs. 1697920.00

PROJECT -25. Principal Investigator: Dr. Tanuja Mohanty

Co-Principal Investigator: Dr. Jyoti Sarup

Project Title: Remote Sensing and GIS Based Environmental Impact Assessment Study of the Betwa River near Bhopal

Funding Agency: NPIU (TQIPIII)

Sanctioned Amount: Rs 1008000.00

“An attempt has been made to apply geochemical analysis of river bed sediments to a prima-facie tectonic controlled river basin. Hence, the standard methodology of field and remote sensing data acquisition from multiple sources with varied resolutions, data analysis using available commercial softwares and statistical approaches have been adopted.”

PROJECT -26. Principal Investigator: Dr. Manmohan Kapshe

Co-Principal Investigator: Dr.Nakul Dhagat & Dr.Charumitra Kapshe

Project Title: Collection of Data related to GHG emission and low carbon technologies in India.

Funding Agency: : Mizuho Information and Research Institute, Tokyo, Japan

Sanctioned Amount: 654000.00

PROJECT -27. Principal Investigator: Dr. Manmohan Kapshe



Co-Principal Investigator: Dr. Vinay Mohan Das, Dr. Yogesh K Garg, Dr. Charumitra Kapshe and Dr. Nakul Dhagat

Project Title: Water for Change. Integrative and firm for purpose water sensitive design framework for fast growing livable cities.

Funding Agency: Department of Science and Technology, GOI In collaboration with Netherlands Organisation for Scientific Research

Sanctioned Amount: Rs. 16986860.00

“The objective of the component being dealt by MANIT is to enable water security and ecosystem health outcomes based on Socio-cultural analysis and profiling, that focuses on socio-cultural behavioral aspects, water supply and demand. Specific objectives will focus on: possible roles of individuals and community. Effect of individuals and community, Influence and sensitivities of individuals and community, Motivation and abilities of individuals and community.”

PROJECT -28. Principal Investigator: Dr. Mohd. Taufik

Project Title: Development of Pellet and Filament form integrated multi material co-extruder system for improved additive manufacturing process

Funding Agency: Department of Science and Technology, Science and Engineering Research Board (SERB), GOI

Sanctioned Amount: Rs. 1763650.00

Brief Abstract : *“To design and fabricate a co-extruder that can be used for fused layer fabrication of pellet and filament form materials.”*

PROJECT -29. Principal Investigator: Dr. Alok Mittal (India) and Dr. Richard Thornton Baker (Foreign), University of St Andrews, United Kingdom

Project Title: Design and Evaluation of Nanostructured Materials For Wastewater Treatment

Funding Agency: Scheme for Promotion of Academic and Research Collaboration (SPARC), HRD

Sanctioned Amount: Rs. 6661612.00

PROJECT -30. Principal Investigator: Dr. Shailendra Kumar, EE

Project Title: Design and Development of Multi-functional PV-Battery Based Smart Charging Stations for EVs, Household load and Grid

Funding Agency: DST SERB under start up research grant (SRG)

Sanctioned Amount: Rs. 30 Lakhs

“Brief Abstract-The main objective is to develop various cost-effective topologies and optimized intelligent control algorithms for the charging station to charge the battery of EVs, reliable and secure power supply for the domestic nonlinear loads under abnormal Indian grid scenario. Development of appropriate control mechanisms for charging station for power quality improvement and mitigating various issues such as harmonics, reactive power, unbalanced loading, power factor, neutral current etc while meeting the IEEE 519 and IEEE 1547 standards. Reducing the number of devices, uninterrupted power supply across the home appliances, reduced converter stages and increased efficiency of the charging station, are the main objectives of this project”.

PROJECT -31. Principal Investigator: DR.CHARU PARASHAR (Civil)

Project Title: Dam Rehabilitation and Improvement Project (DRIP)

Funding Agency: CENTRAL WATER COMMISSION

Sanctioned Amount: Rs. 101.60 Lakhs

Brief abstract: *MANIT agrees to develop required facilities to provide the consultancy services to the state level implementing Agencies (IAs) and training programmes in the following areas of work:*

- *Design Flood Studies*
- *Flood Routing Studies*
- *Dam Break Analysis*
- *Reservoir sedimentation studies*
- *Geotechnical, Geophysical and Geological investigations*
- *Structural and geotechnical designs*
- *Structural safety assessments*

PROJECT -32. Principal Investigator: Dr. Sudhanshu Kumar (ME)

Project Title: Generation of accurate bore cavity by developing an algorithm using Electrical Discharge Boring (EDB) process.

Funding Agency: DST SERB under start up research grant (SRG)

Sanctioned Amount: Rs. 23.36 Lakhs

“Overcut is one of the major limitations of the cavity generated by the Electrical discharge machining process. Industries are spending their valuable times as well as resources to reduce the overcut in cavity. Machine operators are struggling for getting accurate size of cavity. Keeping the above problem in centre, a novel method of drilling a cavity using EDM process has been proposed which will give accurate bore cavity. The objectives of the proposed research are to identify most suitable boring strategy in EDM process and to reduce the overcut within acceptable limit by adopting an iterative algorithm”.

PROJECT -33. Principal Investigator: Dr. Pushendra Kumar (Maths)

Project Title: Prediction of Fire Signatures Using Smoke Features Based on Fractional Order Optical Flow in Videos

Funding Agency: Science and Engineering Research Board (SERB), Department of Science & Technology, Govt. of India

Sanctioned amount: Rs. 26.2984 Lakhs

Brief Abstract: *“In the proposed project, a fractional order variational fire model will be presented by generalizing an integer order variational optical flow model. In particular, the proposed fire model will be designed by incorporating the fire characteristics. The broad classification of fire will be performed by means of smoke because it is the early stage of a fire. A new set of features related to flow magnitudes and directions such as transport energy, flow magnitude, directional variance and matching ratio in combination of color, shape and texture will be used as the fire feature selection methods. The feature classification will be done using new classification techniques. Dataset comprising of real and synthetic will be collected for broad analysis. Finally, the developed methods will be compiled in the form of a GUI software to perform real time classification”.*