Dharmsinh Desai University

About Research & Development Center:

R&D centre of DDU started from 1998 and its main objective is to carry out research activity in the area of Information Technology, Computer Science, Computer Application and Electronics & Communication with the respective faculty members. It has taken up **national level projects** from pioneer institutes like **National Crime Record Bureau (NCRB)**, **Institute of Plasma Research, Department of Science and Technology (DST), Physical Research Laboratory (PRL), Oil and Natural Gas Corporation Limited (ONGC), Gujarat Samachar**, **Muljibhai Patel Urology Hospital (MPUH), Forensic Laboratory** and many others. It has the distinction of developing a **Color Portrait Building System** which is successfully used at every **District Police Head Quarters** in the Country to arrest criminals. R & D centre has guided several projects of **under-graduate, post-graduate and Ph.D. students i**n very diverse areas.

Events

- Organized 14th PLANEX Workshop on "Instrumentation for Planetary Exploration "At R&D Center, DDU (6 -10 January 2014).
- Organized One-day seminar on “Highlights on Indian Planetary Exploration Missions” organized at DDU on 10th September, 2013.
- Received Best Poster Award for “Crater Simulation and Automatic Classification with Virtual 3D Navigation” – Indian Planetary Science Conference, PRL, ISRO, 2017
- Received Best Poster Award for “Distributed Smart Payload Instrumentation for Planetary Rover Using Mini Rovers” – Indian Planetary Science Conference, PRL, ISRO, 2020

Research

- **Ongoing projects**
    - Designing a Reflecting Light Microscope for 3D Imaging of Thick and Irregular Surface (On Going)
    - An accurate, environment friendly and fully automatic ppb level arsenic analyzer (On Going).
    - Modelling and prediction for control of plasma disruptions in Tokamak using machine learning (On Going).
    - Development of High Performance Overhead High Voltage Bare Conductor for Transmission Line (On Going).

- **Completed projects:**
    - Planetary Exploration Technology Research
        - Astro-material Analysis
        - Crater Simulation Modelling and Analysis
        - Radiation Counting Efficiency Improvement Using Noise Signature Anti-coincidence
    - Development of Embedded and FPGA Application Modules for Space Payloads
    - Algorithm for Image De-Blurring (on going PhD)
    - Algorithm for Forecasting Rainfall (PhD)
    - Utilities for Large Biological Databases (PhD)
    - Motor Control Using Space Vector Modulation (IEDC)
    - A Novel Hybrid Wireless Sensor Network Development System For Smart City (IEDC)
    - Solar Powered Sensor Networking for Drip Irrigation(IEDC)
    - Smart Predicting Thermometer (IEDC)
    - DDU Robot with Gripper and Path Finder
    - Color Portrait Building System (NCRB)
    - Portrait Building System (NCRB)

- Coupled Oscillators Simulation and PC Based Data Acquisition System (IPR)
- Hand Written Text Recognition With Speech Output (PhD Work)
- Indian Classical Music Trainer with 200 Ragas Database (DDU)
- Medical Information Management using Internet with On-Line ECG Machine (DDU)
- Skull Image to Face Identification System (FSL)
- Neural Network Tool Box using C++ (PhD Work)
- Email Bulletin Board for Villages using POCSAG code (Gujarat Samachar News Paper)
- Pattern Recognition Tool Box using Neural Network (PhD Work)
- Simulation of Two Legged AI Based Walking Robot using Neural Network (PhD Work)
- Time Series Data Prediction using Time Delay Neural Network (PhD Work)
- Image Band Compression using Vector Quantization (PhD Work)
- Continuous Tubular Reactor Simulator(GUI) (PhD Work)
- Mobile Multi Tasking Gripper Robot (DDU ROBO) (DDU)

- **Completed Ph.D. Thesis:**
    - Novel Neuro-Statistical Algorithm for Computational Characterization of Proteins.
    - Modeling and Prediction of Rainfall Data.
    - Development of Integrated Embedded Intelligence for Imaging Applications
    - Development and Characterization of Silicon Drift Detector based X-Ray Spectrometer for the Space-borne Experiments.
    - Protein Function Identification by Predicting Protein Structure using Machine Learning
    - A novel approach to radiation detector readout system for space borne instrumentation

- **Ongoing Ph.D. Topics:**
    - Dynamic Optimization of Power and Operational Efficiency in Wireless Sensor Network.
    - Application of Machine Learning and IoT to Enhance Process Automation
    - Optimization of High Voltage Transmission Line with Overhead Bare Conductor for Enhance Electrical Power Efficiency: A Survey, Study and Enhancement Strategies

R&D Projects:

Project Title	Sponsoring Agency	Status
Designing a Reflecting Light Microscope for 3D Imaging of Thick and Irregular Surface	Department of Science & Technology	On-Going
An accurate, environment friendly and fully automatic ppb level arsenic analyzer	Department of Science & Technology	On-Going
Modelling and prediction for control of plasma disruptions in Tokamak using machine learning	Department of Atomic Energy	On-Going
Development of High Performance Overhead High Voltage Bare Conductor for Transmission Line	Apar Industries Ltd.	On-Going
Development of Embedded and FPGA Application Modules for Space Payloads	Physical Research Laboratory	Completed
Crater Simulation Modeling and Analysis under Planetary Exploration Technology Research	Physical Research Laboratory	Completed
Astro-Material Analysis under Planetary Exploration Technology Research	Physical Research Laboratory	Completed
Radiation Counting Efficiency Improvement Using Noise Signature Anti-coincidence under Planetary Exploration Technology Research	Physical Research Laboratory	Completed
Measurement and Control of Temperature Using Neural Network based Prediction Algorithm for Industrial and Space Application	IEDC - DST	Completed
Color Portrait Building System	National Crime Record Bureau	Completed
Portrait Building System	National Crime Record Bureau	Completed
A Low Cost Low Maintenance Solar-Powered Drip Irrigation System Design	IEDC - DST	Completed
Microcontroller Based Implementation of Space Vector Modulation Direct Torque Controller for Industrial Permanent Magnet Type Motor Control (SVM-DTC)	IEDC - DST	Completed
Coupled Oscillators Simulation and PC Based Data Acquisition System	Institute of Plasma Research	Completed
Hand Written Text Recognition With Speech Output	DDU PhD work	Completed
Indian Classical Music Trainer with 200 Ragas Database	DDU	Completed
Medical Information Management using Internet with On-Line ECG Machine	DDU	Completed

Skull Image to Face Identification System	Forensic Science Laboratory, Gujarat	Completed
Neural Network Tool Box using C++	DDU PhD work	Completed
Email Bulletin Board for Villages using POCSAG code	Gujarat Samachar News Paper	Completed

Pattern Recognition Tool Box using Neural Network	DDU PhD work HSM	Completed
Simulation of Two Legged AI Based Walking Robot using Neural Network	DDU PhD work HSM	Completed
Time Series Data Prediction using Time Delay Neural Network	DDU PhD work HSM	Completed
Image Band Compression using Vector Quantization	DDU PhD work	Completed
Continuous Tubular Reactor Simulator(GUI)	DDU PhD work	Completed
Mobile Multi Tasking Gripper Robot (DDU ROBO)	DDU	Completed

Student Projects:

Sr. No.	Project Title	Student Name	Stream	Duration-Time
1	Parameter Measurement Using Multiple Sensor System	Bina H. Tailor	M.E.E.C	2010
2	Web Based Search Engine for Protein Database	Roma Maru Nilam Desai	BCA	2011
3	e-Trading Website for student community	Utsav Patel	BCA	2008
4	Design of Research & Development Website with Mobile Authentication Tool	Himanshu Purohit	BCA	2008
5	Validation And Testing of Human Face Components Classification	Chintan Porecha	BCA	2009
6	IRIS Recognition for Person Identification	Hiral Mehta	M.E.E.C	2009
7	Design, implementation and Control of Space Vector Modulation Technique for AC Induction Motor and Permanent Magnet Synchronous Motor	Riddhi Mehta Ankit Patel Anjan Singh Tarang Pandya	M.E.I.C	2012
8	Sensor Networking and Irrigation Control for Drip irrigation	Ankit Patel	M.E.I.C	2012
9	Soil Moisture Sensor and Solar Power Energy Source for Drip Irrigation	Palak Gajjar	M.E.I.C	2012
10	Image Identification using Mobile	Nikul Patel Pratik Patel	MCA	2010
11	A Nanosatellite based Relay Station with High Gain Antenna Array	JImit Raja	B.E.E.C	2011
12	Creation of Image Database of Moon Surface and Analysis of Important Features.	Himanshu Purohit Vivek Fumakia	MCA	2010
13	3D Human Face Reconstruction from multiple 2D Images	Chuahan Priyank Y.	MEIT	2013
14	Detection and Characterization of Planetary crater with 3D visualization and classification	Nimavat Divya J.	MEIT	2013
15	A Web Based Protein Data Processing Algorithms and Utility	Ankita Baravaliya	MEIT	2013
16	Rock Classification using Computational Intelligence	Sagar Soni	MEIT	2013
17	Automatic Registration, Integration and Enhancement of ISRO and NASA	Vivek Kumar	MEIT	2014-15

	missions Reflectance Maps of Lunar Surface			
18	Simulation and 3D Visualization of Complex Molecular Structures for Study of Protein and Nano-Materials	Shivangi Shah	MEIT	2014-15
19	Development of Data Acquisition and control using android phone , FPGA and sensor for space applications	Lisha Gandhi	MEIT	2014-15
20	A Novel Hybrid Wireless Sensor Network Development System for Smart City	Anal Jaiswal Divyesh Gaur Shaunak Sangdod	MEIT	2014-15
21	Crime Detection from Mobile Call Details Records (CDR) using Pattern Recognition Approach	Nishaba Rana		2015-16
22	Identification of Biomarkers from Characterization of Malignant Protein Sequence Using Big Protein Database	Janki Patel	MEIT	2015-16
23	High level Synthesis of Generic Algorithm used in Space Payload using FPGA	Shivangi Shah	MEIT	2015-16
24	Designing 3D Imaging Algorithm of Thick and Irregular Surface using Reflecting Light Microscope	Dharmistha Dhimmar	MEIT	2015-16
25	3D Visualization of Microscopic objects	Solanki Anupama A.	MEIT	2016-17
26	Peptide Markers Based prediction of Antigen Sequence using Neural Network	Oza Ragini V.	MEIT	2016-17
27	Design and test of Fluxgate Magnetometer Sensor prototype Payload	Singh Gautami	MEIC	2016-17
28	Characterization of u-meter for Fluxgate Magnetometer and DC-DC Converter Application	Viva Varghese	MEEC	2016-17
29	Understanding Indus Valley Script Using Computational Intelligence	Akshay P. Patel Solanki N. Shah	BEIT	2017-18
30	Autofocus Algorithm Development for 3D Microscopy	Vaghela Priyalba. B		
31	Classification Of A Disruption Phase In A Plasma Shot From A Tokamak Using Machine Learning	Dave Raunak M.	MEIT	2018-19
32	Development of IoT Based Data Acquisition And Analysis System for Improving the Emissivity of Overhead Bare Conductor	Amit Kumar	MEEC	2022-23

Patents & Publications

Patent:

Year :2020-21

AN ENHANCED OPTICAL 3D AUTO MICROSCOPE

Patentee : Dr. Himanshu Mazumdar

Indian Patent Application No : 202021029487, Published On : 07/10/2020

Publications

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2. Mehta Apurva, Himanshu Mazumdar, "Predicting structural class for protein sequences of 40% identity based on features of primary and secondary structure using Random Forest algorithm, Computational Biology and Chemistry", (ELSEVIER) Volume 84, February 2020, 107164,ISSN 1476-9271
3. Apurva Mehta, and Himanshu Mazumdar. "Discovery of Significant miRNA-biomarkers for Breast Cancer using Decision Tree Classifier" International Journal on Emerging Technologies 11(2):453-460(2020)
4. Apurva Mehta, and Himanshu Mazumdar. "Protein Fold Prediction for Protein Sequences of Low Identity based on Evolutionary and Spatial Features using Random Forest Algorithm" Biointerface Research in Applied Chemistry 10(5):6306-6316(2020)
5. Apurva Mehta, and Himanshu Mazumdar. "Recent Trends in Machine Learning-based Protein Fold Recognition Methods" Biointerface Research in Applied Chemistry 11(4):11233-11243(2020)
6. YK Meghrajani, LS Desai, HS Mazumdar , “Secure and efficient arithmetic-based multi-secret image sharing scheme using universal share”, Journal of Information Security and Applications (ELSEVIER)Volume 47,Pages 267-274, 2019.
7. Rutu S Patel, Himanshu S Mazumdar, “Prediction of Bank Investors using Neural Network in Direct Marketing”, International Journal of Engineering and Applied Sciences (IJEAS) ISSN: 2394-3661, Volume-5, Issue-2, February 2018
8. Himanshu S. Mazumdar and Ragini V. Oza, " Agpred: Antigen Prediction Using Neural Network Based On Tri-Peptide Markers ", ejbps, Volume 4, Issue 11, 514-519, 2017.
9. RV Oza, HS Mazumdar, "Peptide Markers based Prediction of Antigen Sequence using Neural Network", Int. J. Pure App. Biosci 5 (1), 759-770, 2017
10. YK Meghrajani, HS Mazumdar, "Region splitting visual cryptography using random grids", Journal of Discrete Mathematical Sciences and Cryptography 19 (5-6), 1013-1023, 2016
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12. M Shanmugam, YB Acharya, SV Vadawale, HS Mazumdar, "Experimental characterization of Silicon Drift Detector for X-ray spectrometry: Comparison with theoretical estimation ", Measurement 91, 66-72, 2016
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14. YK Meghrajani, HS Mazumdar, " Hiding secret message using visual cryptography in steganography", India Conference (INDICON), 2015 Annual IEEE, 1-5,2015

15. S Agrawal, HS Mazumdar, "Economic viability and Future Impact of Internet of Things in India: An Inevitable wave ", arXiv preprint arXiv:1601.04363,2015
16. M Shanmugam, SV Vadawale, YB Acharya, HS Mazumdar, "Space radiation induced displacement damage effects on the performance of the silicon drift detector onboard chandrayaan-2 mission ", Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC), 2015 …,2015
17. YK Meghrajani, HS Mazumdar, "Enhanced Contrast of Reconstructed Image for Image Secret Sharing Scheme Using Mathematical Morphology ", Journal of Information Security 6 (04), 273,2015
18. M Shanmugam, YB Acharya, SV Vadawale, HS Mazumdar, "Radiation effects on Silicon Drift Detector based X-ray spectrometer on-board Chandrayaan-2 mission ", Journal of Instrumentation 10 (09), P09005,2015
19. V Kumar, HS Mazumdar, "Automatic Registration, Integration and Enhancement of India's Chandrayaan-1 Images with NASA's LRO Maps ", International Journal of Research in Engineering and Technology 4 (03), 614-623,2015
20. LP Gandhi, HS Mazumdar, "SMARTPHONE-FPGA BASED BALLOON PAYLOAD USING COTS COMPONENTS ", International Journal of Research in Engineering and Technology 4 (3), 562-568,2015
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23. MS Patel, HS Mazumdar, "Knowledge base and neural network approach for protein secondary structure prediction ", Journal of theoretical biology 361, 182-189,2014
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27. S Mahajan, H Mazumdar, "A Fast Learning Algorithm for Rainfall Prediction ", International Journal of Computer Applications 85 (15),2014
28. HS Mazumdar, AC Baravaliya, MS Patel, "Keyword based Iterative Approach to Multiple Sequence Alignment ", Int. J. Pure App. Biosci 2 (3), 139-144,2014
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41. HS Mazumdar, A Amodia, HK Purohit, "Pulse Shape Recognition using Wavelet and Neural Network ", Planetary Science and Exploration, 2011
42. HS Mazumdar, A Amodia, PV Patel, " Rock Image Classification", Planetary Science and Exploration, 2011
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