

Aditya Chandra Mandal

Final Year IDD (B.Tech, M.tech) | Mining Engineering | IIT (BHU), Varanasi
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EDUCATION

IDD (B.TECH,M.TECH) (MIN. ENG)
IIT (BHU),VARANASI | EXPECTED 2022
CGPA: 8.27/10.0

INTERMEDIATE (XII)
KRISHNATH COLLEGE SCHOOL | 2017
Percentage: 82.2/100

COURSEWORK UNDERGRADUATE

ongoing*
Fiber Optics
Optical Communication Networks
Distributed Computing *
Fourier Optics and Imaging
Fundamentals of Electronics and Instrumentation Engineering
Fundamental of Electrical Engineering
Computer Programming
Engineering Mathematics-I, II
Probability and Statistics

RESEARCH INTEREST

Biophotonics
Data Structures and Algorithms
Digital Signal Processing
Fourier Optics and Imaging
Digital Holography
Microscopy
Pupillometry
Deep Learning

SKILLS

PROGRAMMING

Languages
• C++ • MATLAB • Python
Frameworks
• PyTorch • Keras
Others
• NumPy • Scikit-learn
• Torch • OpenCV

LINKS

LinkedIn:// [Aditya Chandra Mandal](#)
Research Grants:// [Tech CMPDI](#)
Google Scholar:// [Scholar](#)
ResearchGate:// [Aditya Chandra Mandal](#)

EXTRA-CURRICULAR ACTIVITIES

- Attended the online KSOP-QMat Summer School 2020, Karlsruhe Institute of Technology
- Attended virtual IONS OPUMA conference, Optical Society of America, 2020 [National Autonomous University of Mexico]
- Selected for environmental resilience track and participated in MIT India Initiative - Design, Technology, and Social Innovation Workshop 2020
- Attended virtual CLEO Conference and Exhibition 2020 and 2021

PROJECTS

PHASE MICROSCOPY USING DEEP LEARNING | MAY 2021 – PRESENT

Dr. Peter So, Dr. Zahid Yaqoob, Dr. Dushan N. Wadduwage | MIT and Harvard University | Remote

- Developed a computational forward model of Diffraction Phase Microscopy (DPM) using MATLAB.
- Developing a neural network model to perform phase reconstruction from captured interferogram to replace conventional phase retrieval algorithms (e.g. Hilbert transform) in DPM.

VISIBLE LIGHT PUPILLOMETRY | MAY 2020 – PRESENT

Dr. Vasudevan Lakshminarayanan | University of Waterloo | Remote

- Developed a novel approach [3] to pupillometry that used deep-learning applied to Visible Light eye images.
- Implemented the neural network to segment the pixels denoting the pupil in an RGB image and predicted a binary segmentation pupillary mask as output.
- Performed direct pupil parameters estimation using deep learning for Visible Light Pupillometer as an extension of the above research. A abstract (Link://**Abstract**) on this research was accepted for presentation in SPIE Photonics West 2022.

COHERENCE HOLOGRAPHY USING SINGLE-PIXEL DETECTOR | SEPTEMBER 2019 – AUGUST 2021

Dr. Rakesh Kumar Singh | IIT BHU

- Developed a complete theoretical framework [1] to reconstruct the complex fields of object encoded in holography as the distribution of the complex coherence function using a single-pixel detector.
- A complete wavefront reconstruction without an interferometric setup while maintaining the advantages of intensity correlation.
- Completely new theory and method for complex wavefront reconstruction in the correlation- based imaging and kept advantages and stability of the Hanbury Brown-Twiss approach.
- Performed the simulation using MATLAB and the paper [1] on this work is under peer review process for journal publication.

INLINE POLARIZATION HOLOGRAPHY ASSISTED BY DEEP LEARNING | DECEMBER 2020 – PRESENT

Dr. Rakesh Kumar Singh | IIT BHU

- Developed a deep learning technique that took advantage of the main characteristic of unsupervised neural network for blind single-shot inline polarization hologram reconstruction solely based on the captured sample and without the need for a large dataset of samples with available ground truth to train the model.
- Successful elimination of twin image originating from the phase-conjugate wavefront in the reconstruction stage and in the process of writing a paper on the work done

GRANTS

MINISTRY OF COAL (INDIA) STUDENT PROJECT GRANTS | MARCH 2021 – MAY 2022

- Received a student project grant [code- MT-174, sl No.-11] of INR 3684000 from the Ministry of Coal for the design and development of a drone-mounted optical sensor for continuous monitoring of particulate matter in opencast mines.
- Appointed as primary researcher for this project under the guidance of Dr. Rakesh Kumar Singh and Dr. Piyush Rai, IIT (BHU) Varanasi.

PREPRINTS

1. Mandal, A.C., Sarkar, T., Zalevsky, Z. and Singh, R.K., 2021. Structured transmittance illumination coherence holography. arXiv preprint arXiv:2109.10326.

PUBLICATIONS

2. Sarkar, T., Mandal, A.C., Ziyang, C., Jixiong, P. and Singh, R.K., 2021. Correlation Holography with A Single-Pixel Detector: A Review. Laser & Optoelectronics Progress, 58(10), p.1011011.
3. Mandal, A.C., Phatak, A., Balaji, J.J. and Lakshminarayanan, V., 2021, August. A deep-learning approach to pupillometry. In Applications of Machine Learning 2021 (Vol. 11843, p. 1184312). International Society for Optics and Photonics.