SHREYAS PADHY

◇ +919312949243
shreyas@jhu.edu ◇ shreyaspadhy@gmail.com

EDUCATION

Indian Institute of Technology Delhi **May 2017**
B.Tech in Engineering Physics
Overall GPA: 8.923/10 (DR 4)

RELEVANT COURSEWORK

Biomedical Image and Signal Processing, Computational Optical Imaging, Numerical Methods in Electromagnetics[1], Computational Physics, Statistical Physics, Mathematical Physics, Linear Algebra, Calculus, Data Structures & Algorithms, Artificial Intelligence, Signals & Systems

RESEARCH INTERESTS

Medical Image Analysis and Computing, Computational Neuroscience, Machine and Deep Learning

RESEARCH PROJECTS

Adaptive Meshing in Diffuse Optical Tomography **June 2016 - August 2016**
Under supervision of Dr. Simon Arridge, Director, Centre for Inverse Problems, Centre for Medical Image Computing, University College London

- Worked on formulating a-posteriori error and adaptive meshing algorithms for two and three-dimensional diffuse optical tomography.
- Developed adaptive meshing and a-posteriori error calculation routines for the TOAST++ software package for diffuse optical tomography.

Fourier Ptychography using Sparsity Constraints **May 2016 - December 2016**
Under supervision of Dr. Kedar Khare, Dept. of Physics, IIT Delhi

- Worked on improving the efficiency of the Fourier Ptychographic Microscopy method in bio-medical imaging, and reduce individual imaging requirements by incorporating sparsity constraints and image perturbations in phase retrieval algorithms.

Adaptive Meshing Techniques in Microwave Imaging **May 2015 - Dec 2015**
Under supervision of Dr. Uday Khankhoje, Dept. of Electrical Engineering, IIT Madras

- Worked on adaptive meshing techniques to improve resolution and computational time for bio-medical microwave imaging of cancerous tumors.
- Implemented an inverse solver for microwave imaging using the Contrast Source Inversion technique.
- Designed an adaptive mesh reconfiguration algorithm that uses a multilevel sampling algorithm based on filtered backpropagation predictions of the solution to the inverse problem.

Stochastic Methods in Rough Surface Scattering **December 2015 - May 2016**
Under supervision of Dr. Uday Khankhoje, Dept. of Electrical Engineering, IIT Madras

- Worked on stochastic modelling of rough surfaces to improve speed of forward solver in radar backscattering from inhomogeneous rough soil.
- Implemented a stochastic modelling of the rough surface using a Kosambi-Karhunen-Loeve expansion in the Galerkin polynomial chaos basis involved in the Finite Element Method solution.

PUBLICATIONS

Journals

Uday K. Khankhoje and Shreyas Padhy, "Stochastic Solutions to Rough Surface Scattering using the finite element method, *IEEE Transactions on Antennas and Propagation*, **(To-appear: Vol 65, No 08), 2017**. DOI: 10.1109/TAP.2017.2715366 IEEE

[1]Non-graded

RESEARCH EXPOSURE

UCL Medical Image Computing Summer School **July 2016**
Conducted by Centre for Medical Image Computing, University College London

- Worked on image segmentation of brain MRI samples using global and local voting techniques under the supervision of Dr. Jorge Cardoso, CMIC.
- Attended a five day course covering Image Acquisition, Reconstruction, Modelling, Optimizations, and Systems & Pipelines.

TECHNICAL PROJECTS

Automatic Lung Nodule Detection with Conv. Neural Networks **April 2017 - May 2017**
Course Project, Under supervision of Dr. Anup Singh, Dept. of Biomedical Engineering, IIT Delhi

- Inspired from the LUNA 2016 Grand Challenge to segment out possible cancerous pulmonary nodules from low-dose CT scans of lung tissues, we implemented a U-net type architecture to perform automatic segmentation of pulmonary nodules from lung CT images.

Medical Diagnosis using Bayesian Networks **April 2015 - May 2015**
Course Project, Under supervision of Dr. Mausam, Dept. of Computer Science, IIT Delhi

- Used the Expectation-Maximization algorithm to learn the Conditional Probability Table for a Bayesian Network for medical diagnosis of strokes from certain pathological markers from medical data with an incomplete data-set.

Multiple Sequence Alignment of DNA **February 2015 - May 2015**
Course Project, Under supervision of Dr. Mausam, Dept. of Computer Science, IIT Delhi

- Implemented depth-first-search with branch & bound for optimal solutions to alignment of DNA sequences.
- Implemented greedy hill-climbing local search with simulated annealing and pseudo-random restarts, for non-optimal solutions.

Analysis of Crab Nebula using Ground Based Gamma Ray Telescopy **December 2013**
Under supervision of Dr. Kuldeep Yadav, Bhabha Atomic Research Centre

- Analysed the periodicity and spectrum of the gamma ray emission of the Crab Nebula using very high energy ground-based gamma ray telescopy methods.
- Analysed data obtained from observations made by the TACTIC telescope located at Mt. Abu, Rajasthan.

TECHNICAL STRENGTHS

Computer Languages	Python (Pytorch), C++, LaTeX, Verilog
Medical Imaging	TOAST++, FSL, SPM
Computational EM	Meep (FDTD), Cubit (Meshing), Seldon
Mathematical Computing	MATLAB, R
App Design	iOS (Objective C)

SCHOLASTIC ACHIEVEMENTS

- Received Merit Scholarship for Top 7% GPA in institute in Fall Semesters, 2013, 2014, 2015 and 2016.
- Received Summer Undergraduate Research Award 2015 for "Adaptive Meshing for Biomedical Imaging".
- Recipient of the KVPY Scholarship from the Department of Science, Government of India.
- Recipient of the NTSE Scholarship from NCERT, Government of India.

EXTRA-CURRICULAR ACTIVITIES

National Service Scheme: Worked with the National Association for the Blind as a scribe and exam writer to provide visually impaired students equal opportunities while appearing for tests and qualifying examinations. Worked with the BloodConnect Organization at IIT Delhi and Safdarjung Hospital.
Physics & Astronomy Society: Senior Coordinator for the National Astronomy Festival "Astroweek 2015" held at IIT Delhi.
Quizzing Society: Coordinator and Quizmaster for the Rendezvous National Quizzing Fest 2015.