SHREYAS PADHY

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EDUCATION

Indian Institute of Technology, Delhi   **May 2017 (expected)**
B.Tech in Engineering Physics
Overall GPA: 8.802/10

RELEVANT COURSEWORK

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

RESEARCH INTERESTS

Medical Image Computing, Forward and Inverse Problems in Medical Physics, Computational Electromagnetics and Optics

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   **Jan 2016 - May 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 Delhi

· Worked on adaptive meshing tehniques 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 Delhi

· Worked on stochastic modelling of rough surfaces to improve speed of forward solver in radar backscattering from inhomogenous 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

Manuscripts

Uday K. Khankhoje and Shreyas Padhy, "Stochastic Solutions to Rough Surface Scattering using the Finite Element Method", **2016**, submitted for review to IEEE Transactions on Antennas and Propagation

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[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.

Pulsar Observatory for Students   July 2013
Conducted by National Centre for Radio Astrophysics

- Performed time-series observations for prominent pulsars B1642-03, B1133-16, and Vela pulsar using the Ooty Radio Telescope.
- Calculated the dispersion measure, flux density, period, modulation index and pulse broadening of B1642-03 and the Vela pulsar.

TECHNICAL PROJECTS

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.

Amateur Radio Interferometer Experimental System   July 2015 - Dec 2015
Under the ARIES program, IIT Delhi

- Made an amateur radio telescope from a satellite dish capable of recording the 21cm line from measurements of the Sun.
- Built a two-dish interferometer with a tracking mount to capture the 21cm galactic emission line.

TECHNICAL STRENGTHS

Computer Languages	C++, Java, Python, LaTeX, Verilog
Computational EM	Meep (FDTD), Cubit (Meshing), Seldon
Mathematical Computing	MATLAB, Mathematica, R
App Design	iOS (Objective C)

SCHOLASTIC ACHIEVEMENTS

- Received Merit Scholarship for Top 7% GPA in institute in Fall Semesters, 2013, 2014 and 2015.
- Received Summer Undergraduate Research Award 2015 for "Adaptive Meshing for Bio-Medical Imaging".
- Recipient of the KVPY Scholarship from the Dept. of Science, Government of India, in the years 2011-2013.
- Recipient of the NTSE Scholarship from NCERT, Government of India, in the year 2010-2012.

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 and Astronomy Society

- Senior Coordinator for National Astronomy Festival "Astroweek 2015" held at IIT Delhi
- Winner, Astronomy Quiz 2014, Esya Festival, Indraprastha Institute of Information Technology Delhi