SHREYAS PADHY

LinkedIn: https://in.linkedin.com/in/shreyaspadhy
E-mail: ph1130871@physics.iitd.ac.in ⋄ shreyaspadhy@gmail.com

EDUCATION

Indian Institute of Technology, Delhi **May 2017 (expected)**
B.Tech in Engineering Physics
Overall GPA: 8.81/10

RELEVANT COURSEWORK

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

RESEARCH INTERESTS

Computational Methods in Medical Imaging, Computational Electromagnetics and Optics, Astrophysics

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

· Developed adaptive meshing and a-posteriori error calculation routines for the TOAST++ software package for diffuse optical tomography
· Worked on basis mapping techniques to separate forward and inverse solving paradigms for individual meshing strategies, experimenting with Krylov and wavelet basis-functions.

Fourier Ptychograpy 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 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.

[1] Non-graded

PUBLICATIONS

Manuscripts

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

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 Vela pulsar.

Winter Internship at National Centre for Radio Astrophysics **December 2014**
Under Dr. Tirthankar Roy Choudhary, NCRA

- Worked on mass functions defining large scale structure in cosmological models defining the early Universe, and the application of random walks in calculating and approximating these mass functions.

TECHNICAL PROJECTS

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.

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 solution to alignment of DNA sequences.
- Implemented greedy hill-climbing local search with simulated annealing, and pseudo-random restarts, for non-optimal solution.

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, 2015 and 2016.
- Received the Summer Undergraduate Research Award 2015 for work done in Adaptive Meshing for Bio-Medical Imaging
- Recipient of the NTSE Scholarship in the year 2010-2011 and the KVPY scholarship in the years 2011-2013