Uday K. Chettiar

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SUMMARY

A focused, hard-working and independent learner; highly skilled in quantitative analysis, probability, statistics (descriptive and inferential), Bayesian probability and inference, data analysis and programming in various environments including Python, C++ and Matlab; highly experienced in numerical programming including time domain methods, linear algebra, optimization methods including stochastic and convex optimization, machine learning and artificial intelligence; familiarity with various statistical packages including R; seeking a position as a **Data Scientist** in a data intensive environment with opportunities to apply mathematical and statistical methods and machine learning principles. My academic accomplishments include over 30 publications in peer reviewed journals (h-index = 22), over 13 talks at international conferences and 2 patents. I am also a referee for several scientific journals including Physical Review Letters, Journal of Optical Society of America B, Optics Letters and Applied Physics Letters.

I am authorized to work in the United States and will not need visa sponsorship.

EDUCATION

PhD	**Purdue University**, ECE, West Lafayette, Indiana, USA	GPA: **4.0/4.0**	Aug 2003 – Dec 2008
MS	**Purdue University**, ECE, West Lafayette, Indiana, USA	GPA: **4.0/4.0**	Aug 2003 – May 2008
BTech	**Indian Institute of Technology Bombay**, EE, Mumbai, India	GPA: **9.22/10.0**	Aug 1999 – May 2003

EXPERIENCE

Post Doctoral Research Associate: Electrical and Systems Engineering, University of Pennsylvania. (02/2009 – 12/2013) Supervisor: Prof. Nader Engheta.

- Lead researcher on mutiple projects involving nano-optics, plasmonics, phase transition materials, nonlinear optics, metatronics and metamaterials.
- Used *machine learning* and *stochastic optimization techniques* to explore parameter space and design optimized nanostructures. Relied extensively on programming in *Matlab* and *Python*.
- Worked on *numerical modeling* of *nonlinear processes* in time domain in order to model phase transition materials, and numerical modeling in frequency domain to model stationary processes.

Graduate Student Researcher: School of Electrical and Computer Engineering, Purdue University. (08/2003 – 02/2009) Advisor: Prof. Vladimir M. Shalaev.

- Developed simulation software using *C++* and *Matlab* based on *parallelized Finite Difference Time Domain* (FDTD) method and *Fourier modal method* to simulate optical metamaterials.
- Provided theoretical and modeling support for the world's first experimental demonstration of negative index of refraction at optical wavelengths and held the record for the demonstration at shortest wavelength (710 nm). Used various *optimization methods* and *parallel programming* on supercomputer clusters to arrive at the target design. Worked extensively in a Linux environment.
- Provided theoretical and modeling support for the world's first optical magnetic material across the whole visible spectrum.
- My work was reported by numerous media outlets including two television news shows.

Summer Internship: Society for Applied Microwave Electronics and Research (SAMEER), Mumbai, India. (03/2002 – 05/2002) Supervisor: Dr. Anuj Bhatnagar.

- Developed a setup with the software for the characterization of optical fibers using the mode field distribution. The software provided the optical fiber parameters by appropriate *data processing* and *statistical analysis* on the images obtained by the setup.

Undergraduate Student Researcher: Dept of Electrical Engg, Indian Institute of Technology Bombay, India. (05/2002 – 05/2003) Advisor: Prof. R. K. Shevgaonkar.

- Analyzed and provided a theoretical model for pulse propagation through a nonlinear direction coupler using coupled mode analysis and nonlinear Schrodinger equation (NLSE). Developed software to solve the *nonlinear equation* in time domain using several techniques to ensure *numerical stability*.

SKILLS

- **Programming Skills**: Highly skilled in C, C++, Parallel computing (MPI, PBS), Fortran, Cluster computation, Python, Linux.
- **Software Packages**: Highly skilled in Matlab, Mathematica, R, MS Excel+VBA, Comsol, CST Microwave Studio, Lumerical FDTD.
- **Frameworks and DB**: Moderate experience with Django, Hadoop, MapReduce, Ruby on Rails, MySQL.

AWARDS AND HONORS

- Finalist for the student presentation award at Frontiers in Optics conference, 2007
- Recipient of Incubic/Milton Chang student travel award, 2007
- NASA Nano 50 Award for the top 50 nanotechnologies, 2006
- Benjamin Franklin-Meissner Fellowship at Purdue University, 2003
- Ranked 168 (top 0.11%) among 150,000 in the joint entrance examination for Indian Institute of Technology, 1999
- Gold medalist in the Indian National Physics Olympiad, 1999