

# Uday K. Chettiar

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## SUMMARY

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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; solid understanding of modern portfolio theory, asset pricing including derivatives using stochastic methods and binomial models; seeking a position with a financial institution as a quantitative analyst. As a part of my efforts towards obtaining a position as a quantitative analyst I have undertaken a significant amount of self-study with the help of the following texts.

- *Foundations of Financial Markets and Institutions* by Fabozzi, Modigliani and Jones.
- *Options, Futures and Other Derivatives* by Hull.
- *Arbitrage Theory in Continuous Time* by Bjork.
- *Advanced Stochastic Models, Risk Assessment and Portfolio Optimization* by Rachev, Stoyanov and Fabozzi.
- *Statistics and Data Analysis for Financial Engineering* by Ruppert.
- *Financial Modeling* by Benninga.
- *Active Portfolio Management: A Quantitative Approach for Producing Superior Results and Controlling Risk* by Grinold and Kahn.
- *Investments* by Bodie, Kane and Marcus.

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

## EDUCATION

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

## AWARDS AND HONORS

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- 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

## EXPERIENCE

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- 02/2009-12/2013 **Post Doctoral Research Associate**, Electrical and Systems Engineering, University of Pennsylvania. Supervisor: Prof. Nader Engheta.
- Lead researcher on multiple projects involving nano-optics, plasmonics, phase transition materials, nonlinear optics, metatronics and metamaterials.
  - Used machine learning and 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.
- 08/2003-02/2009 **Graduate Student Researcher**, School of Electrical and Computer Engineering, Purdue University. Advisor: Prof. Vladimir M. Shalaev.
- Developed simulation tools 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.

05/2002-05/2003 **Summer Internship**, Society for Applied Microwave Electronics and Research (SAMEER), Mumbai, India (Supervisor: Dr. Anuj Bhatnagar).

- Developed a setup with accompanying software for the characterization of optical fibers through 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**, Department of Electrical Engineering, Indian Institute of Technology Bombay, India (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). Created a program to solve the nonlinear equation in time domain using several techniques to ensure numerical stability.

## INVENTIONS

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- Cloaking apparatus, has structure formed of material that has permittivity less than unity or approximately equal to unity, where structure is fixed between cloaked object and observer and includes two surfaces, W. Cai, V. M. Shalaev, Uday K. Chettiar, and A. V. Kildishev, Provisional US patent filed, US2008165442-A1, November 2007.
- Object visibility properties modifying apparatus, has metamaterial properties that are selected such that electromagnetic wave is guided around object, and metamaterial layers provided with electromagnetic properties, W. Cai, Uday K. Chettiar, A. V. Kildishev, and V. M. Shalaev, Provisional US patent files, US2010110559-A1, October 2009.

## SKILLS

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- **Programming Skills:** C, C++, Parallel computing (MPI, PBS), Fortran, Cluster computation, Python.
- **Software Packages:** Matlab, Mathematica, Comsol, CST Microwave Studio, Lumerical FDTD, R, MS Excel.
- **Fabrication:** UV Lithography.