Gopal Nataraj

CONTACT
INFORMATION

Ste. 4125 EECS
University of Michigan
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Ann Arbor, MI 48109

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RESEARCH
INTERESTS

Medical Imaging: Physical Modeling and Image Reconstruction
magnetic resonance imaging; statistical signal processing; machine learning

EDUCATION

University of Michigan   Ann Arbor, MI

Ph.D., Electrical Engineering: Systems   05/2014-present
- ⋄ Thesis: Statistical Methods for Quantitative MRI
- ⋄ Advisors: Prof. Jeffrey A. Fessler and Dr. Jon-Fredrik Nielsen

M.S.E., Electrical Engineering: Systems   08/2012-05/2014
- ⋄ **GPA: 4.00**
- ⋄ **Major**: Signal processing
- ⋄ **Minor**: Biosystems (Biosignals and Imaging)
- ⋄ **Select Coursework**: Image Reconstruction, Machine Learning, Medical Imaging, Optimization, Statistical Signal Processing, Perturbation Theory, Matrix Methods in Signal Processing, Statistical Learning Theory, Random Matrix Theory, Partial Differential Equations

Cornell University   Ithaca, NY

B.S., College of Engineering   08/2008-05/2012
- ⋄ **Primary Major**: Electrical and Computer Engineering
  - – **Major GPA: 3.88**
  - – **Select Coursework**: Digital Signal Processing, Probability and Random Processes, Complex Analysis, Feedback Control Theory
- ⋄ **Secondary Major**: Applied and Engineering Physics
  - – **Major GPA: 3.81**
  - – **Select Coursework**: Quantum Mechanics, Electrodynamics, Waves and Optics, Fluid Mechanics, Mathematical Methods in Physics

JOURNAL
PAPERS

[J2] G. Nataraj, J.-F. Nielsen, and J. A. Fessler, "Optimizing MR scan design for model-based T1, T2 estimation from steady-state sequences," *IEEE Trans. Med. Imag.*, 2016. To appear

[J1] M. A. Noginov, H. Li, Y. A. Barnakov, D. Dryden, G. Nataraj, G. Z. C. E. Bonner, M. Mayy, Z. Jacob, and E. E. Narimanov, "Controlling spontaneous emission with metamaterials," *Opt. Lett.*, vol. 35, no. 11, pp. 1863–5, 2010

CONFERENCE
PAPERS

[C5] G. Nataraj, J.-F. Nielsen, and J. A. Fessler, "Myelin water fraction estimation from optimized steady-state sequences using kernel ridge regression," in *Proc. Intl. Soc. Mag. Res. Med.*, 2017. Submitted

[C4] G. Nataraj, J.-F. Nielsen, and J. A. Fessler, "Dictionary-free MRI parameter estimation via kernel ridge regression," in *Proc. IEEE Intl. Symp. Biomed. Imag.*, 2017. Submitted

[C3] G. Nataraj, J.-F. Nielsen, and J. A. Fessler, "A min-max CRLB optimization approach to scan selection for relaxometry," in *Proc. Intl. Soc. Mag. Res. Med.*, p. 1672, 2015

[C2] G. Nataraj, J.-F. Nielsen, and J. A. Fessler, "Model-based estimation of T2 maps with dual-echo steady-state MR imaging," in *Proc. IEEE Intl. Conf. on Image Processing*, pp. 1877–81, 2014

[C1] G. Nataraj, J.-F. Nielsen, and J. A. Fessler, "Regularized, joint estimation of T1 and M0 maps," in *Proc. Intl. Soc. Mag. Res. Med.*, p. 3128, 2014

TEACHING EXPERIENCE

WyzAnt, Inc. Numerous Locations
Private Tutor 05/2012-present

- Independent contractor for leading online tutoring marketplace
- Subjects: physics, math, computer programming, GRE/SAT/ACT test prep
- Tutor students with wide array of educational backgrounds (high school, undergraduate, graduate) as well as a wide array of ages (15-50)
- Rated **top physics tutor** in Pennsylvania
- For more info: http://www.wyzant.com/Tutors/gopal

University of Michigan Ann Arbor, MI
Graduate Student Instructor 09/2015 - 12/2015

- Junior-level course: Introduction to Probability
- Course instructor: Dr. Achilleas Anastasopoulous

University of Michigan Ann Arbor, MI
Graduate Student Instructor 01/2015 - 04/2015

- Sophomore-level course: Introduction to Signals and Systems
- Course instructors: Drs. Jessy Grizzle and Achilleas Anastasopoulous

Cornell University Ithaca, NY
Physics Tutor 08/2010-05/2012

- Physics Learning Strategies Center
- Manager: Dr. Robert Lieberman
- Tutored students in undergraduate physics courses through private and group-oriented instruction. Gave additional lectures when advisor was unavailable.

Cornell University Ithaca, NY
Teaching Assistant 01/2010-05/2010

- Freshman-level course: Introduction to Nanoengineering
- Course instructor: Dr. Jon Velazquez
- Laboratory instructor and grader

INDUSTRY EXPERIENCE

IBM Corporation Burlington, VT
Characterization Engineer 05/2011-08/2011

- Microelectronics Division, Systems and Technology Group
- Manager: Mr. Michael S. Premsagar

- Developed statistical models to improve functional yield prediction of semiconductor products

UNDERGRADUATE RESEARCH

California Institute of Technology — Pasadena, CA
Student Researcher — 06/2010-08/2010

- Laser Interferometer Gravitational-Wave Observatory (LIGO)
- Advisors: Asst. Prof. Rana Adhikari and Dr. Koji Arai
- Mechanical vibration analysis of passive isolation stacks at the Caltech 40-meter Interferometer, for improvement through active isolation in Advanced LIGO

Norfolk State University — Norfolk, VA
Student Researcher — 06/2009-08/2009

- Center for Materials Research (CMR)
- Advisor: Dr. Mikhail A. Noginov
- Optical and physical characterization of bulk metamaterials (silver nanorod and alumina composites) for use in invisibility cloaking devices

Carnegie Mellon University — Pittsburgh, PA
Student Researcher — 06/2007-07/2007

- Pennsylvania Governor's School for the Sciences (PGSS)
- Advisor: Dr. Michelle Hicks
- Designed and built Wilberforce Pendulums (coupled longitudinal and rotational oscillators)

HONORS AND AWARDS

- Student Travel Grant, *ISMRM* — 2014, 2015
- Student Travel Grant, *Rackham Graduate School* — 2014, 2015
- Fellowship, *Innovative Signal Analysis, Inc.* — 2014
- KLA-Tencor Best Project Award, *KLA-Tencor Inc.* — 2013
- Magna Cum Laude, *Cornell University* — 2012

AFFILIATIONS

- IEEE, *Student Member* — 2013-present
- ISMRM, *Student Member* — 2013-present

COMPUTER SKILLS

- **OOP**: C++, Java
- **Script**: MATLAB, Python
- **Markup**: LaTeX, HTML, CSS

PROFESSIONAL SERVICE

- **President**, ECE Graduate Student Council — 04/2014-08/2016
- **Judge**, Southeastern Michigan high-school science fair — 03/2016