Gopal Nataraj

CONTACT
INFORMATION

Ste. 4125 EECS
University of Michigan
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RESEARCH
INTERESTS

Computational Imaging: from Models, to Algorithms, to Applications
magnetic resonance imaging; statistical signal processing; machine learning

EDUCATION

University of Michigan   Ann Arbor, MI

Ph.D., Electrical and Computer Enginering   05/2014-04/2018
   ⬦ Thesis: Advances in Quantitative MRI:
     Acquisition, Estimation, and Application
   ⬦ Advisors: Prof. Jeffrey A. Fessler and Dr. Jon-Fredrik Nielsen

M.S.E., Electrical and Computer Engineering   08/2012-05/2014
   ⬦ **GPA: 4.00**
   ⬦ **Major**: Signal processing
   ⬦ **Minor**: Biosystems (Biosignals and Imaging)
   ⬦ **Selected Coursework**: Image Reconstruction, Machine Learning, Medical Imaging, Statistical Signal Processing, Perturbation Theory, 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**
     – **Selected Coursework**: Digital Signal Processing, Probability and Random Processes, Complex Analysis, Feedback Control Theory
   ⬦ **Secondary Major**: Applied and Engineering Physics
     – **Major GPA: 3.81**
     – **Selected Coursework**: Quantum Mechanics, Electrodynamics, Waves and Optics, Fluid Mechanics, Mathematical Methods in Physics

JOURNAL
PAPERS

[J4] G. Nataraj, J.-F. Nielsen, and J. A. Fessler, "Fast myelin water imaging via Bayesian experimental design and PERK," 2018. In preparation

[J3] G. Nataraj, J.-F. Nielsen, C. Scott, and J. A. Fessler, "Dictionary-free MRI PERK: Parameter estimation via regression with kernels," *IEEE Trans. Med. Imag.*, 2018. To appear

[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.*, vol. 36, pp. 467–77, Feb. 2017

[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

[C6] G. Nataraj, M. Gao, J. Assländer, C. Scott, and J. A. Fessler, "Shallow learning with kernels for dictionary-free magnetic resonance fingerprinting," in *Int. Soc. Mag. Res. Med. Workshop on Magnetic Resonance Fingerprinting*, 2017

[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.*, p. 5076, 2017

[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.*, pp. 5–9, 2017

[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: 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: Prof. 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)
- Designed and built Wilberforce pendula

HONORS AND AWARDS

- **Best Student Paper Award**, ISBI 2017   04/2017
- Rackham Predoctoral Fellowship for Outstanding PhD Research 04/2017
- Towner Prize for Distinguished Academic Achievement   04/2017
- Fellowship, Innovative Signal Analysis, Inc.   01/2014
- First Place, KLA-Tencor Image Processing Contest   04/2013
- Graduated Magna Cum Laude, Cornell University   05/2012
- Scholarship, Irwin and Joan Jacobs, Cornell University   09/2009-05/2012
- Dean's List, Cornell University (8 semesters)   12/2008-05/2012

PROFESSIONAL SERVICE

- **Reviewer**, Transactions on Medical Imaging   2015-present
- **Reviewer**, ISMRM conference submissions   11/2016
- **President**, ECE Graduate Student Council   04/2014-08/2016
- **Judge**, Southeastern Michigan high-school science fair   03/2016

AFFILIATIONS

- IEEE, Student Member   2013-present

- ISMRM, Student Member   2013-present

COMPUTER
SKILLS

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