

ARCHANA VENKATARAMAN

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Baltimore, MD 21218-2608, United States

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<http://engineering.jhu.edu/nsa/>

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA

- Ph.D.**, Electrical Engineering Sept 2007 – Sept 2012
Thesis Title: Generative Models of Brain Connectivity for Population Studies
Thesis Supervisor: Prof. Polina Golland
- M. Eng.**, Electrical Engineering Sept 2006 – Sept 2007
Thesis Title: Signal Approximation using the Bilinear Transform
Thesis Supervisor: Prof. Alan V. Oppenheim
- S.B.**, Electrical Engineering Sept 2003 – June 2006
Concentration: Communications, Controls and Signal Processing

ACADEMIC AND RESEARCH EXPERIENCE

- John C. Malone Assistant Professor, Johns Hopkins, Baltimore MD** Aug 2016 – Present
Department of Electrical and Computer Engineering
Department of Computer Science (Secondary)
Malone Center for Engineering in Healthcare (Core Faculty)
Mathematical Institute for Data Science (Core Faculty)
- Research Assistant Professor, Johns Hopkins, Baltimore MD** April 2016 – Aug 2016
Department of Electrical and Computer Engineering
- Postdoctoral Associate, Yale School of Medicine, New Haven CT** Jan 2014 – April 2016
Department of Diagnostic Radiology
Yale Image Processing and Analysis Group
Faculty Supervisor: Prof. James S. Duncan
- Postdoctoral Fellow, MIT, Cambridge MA** Sept 2012 – Dec 2013
Department of Electrical Engineering and Computer Science
MIT Medical Vision Group
Faculty Supervisor: Prof. Polina Golland
- Graduate Research Assistant (PhD), MIT, Cambridge MA** Jan 2008 – Aug 2012
Department of Electrical Engineering and Computer Science
MIT Medical Vision Group
Faculty Supervisor: Prof. Polina Golland
- Graduate Research Assistant (MS), MIT, Cambridge MA** Jan 2006 – Dec 2007
Department of Electrical Engineering and Computer Science
Digital Signal Processing Group
Faculty Supervisor: Prof. Alan V. Oppenheim
- Undergraduate Research Assistant, MIT, Cambridge MA** Sept 2004 – Jan 2006
Department of Electrical Engineering and Computer Science
Microsystems Technology Laboratory
Faculty Supervisor: Prof. Anantha P. Chandrakasan

Undergraduate Research Assistant, MIT, Cambridge MA
Department of Electrical Engineering and Computer Science
MIT Nanostructures Laboratory
Faculty Supervisor: Prof. Henry I. Smith

Sept 2003 – June 2004

INDUSTRY POSITIONS

Technical Consultant, Vixiar Medical, Annapolis MD

May 2018 – Present

Intern, MIT Lincoln Laboratory, Lexington MA

Advanced Sensor Techniques Group (103)
Supervisor: Dr. Andrew McKellips

June 2006 – Aug 2006

Intern, Xerox Corporation, Rochester NY

XCEL Summer Internship Program

June 2004 – Aug 2004

AWARDS AND HONORS

John C. Malone Assistant Professorship

April 2017

Council of Early Career Investigators in Imaging (CECI²) Travel Award

April 2016

CHDI Grant, Network Models of Brain Connectivity for Huntington's Disease

2013 – 2014

MIT Lincoln Lab Campus Collaboration Award

2012 – 2014

Advanced Multimodal Neuroimaging Training Program (NIH)

2011 – 2012

National Defense Science and Engineering Graduate Fellowship (NDSEG)

2007 – 2010

MICCAI Student Travel Award (\$500)

Sept 2010

Siebel Scholarship (\$20,000)

2007 – 2008

MIT Provost Presidential Fellowship

2006 – 2007

Morris Joseph Levin Award, Best Thesis Presentation (M.Eng.)

May 2007

Association of MIT Alumnae, Senior Academic Achievement Award (\$500)

May 2006

Xerox Technical Minority Scholarship (\$10,000)

Jan 2006

Maletta Foundation Scholarship, Rochester Engineering Society (\$2500)

Jan 2005

Semiconductor Research Corporation Undergraduate Research Award (\$18,000)

2004 – 2005

Xerox Technical Minority Scholarship (\$2,500)

Dec 2004

National Merit Scholarship (\$2,500)

Sept 2003

BOOK CHAPTERS AND VOLUMES

A. Venkataraman. *Autism Spectrum Disorders: Unbiased Functional Connectomics Provide New Insights into a Multifaceted Neurodevelopmental Disorder.* Connectomics: Methods, Mathematical Models and Applications, Eds. B. Munsel, G. Wu, and P. Laurienti, In Press for 2018.

T. Schultz, G. Nedjati-Gilani, **A. Venkataraman**, L. O'Donnell and E. Panagiotaki (Eds.). *Computational Diffusion MRI and Brain Connectivity: MICCAI Workshops, Nagoya, Japan*, January 2014.

JOURNAL ARTICLES

N.S. D'Souza, N. Wymbs, M.B. Nebel, S. Mostofsky and **A. Venkataraman.** *A Joint Network Optimization Framework to Predict Clinical Severity from Resting State fMRI Data.* In Prep. for NeuroImage, 2018.

J. Craley, E. Johnson, **A. Venkataraman.** *A Spatio-Temporal Model of Seizure Propagation in Focal Epilepsy.* In Prep. for IEEE Transactions on Medical Imaging, 2018.

D. Rangaprakash, M.N. Dretsch, **A. Venkataraman**, J.S. Katz, T.S. Denney Jr. and G. Deshpande. *Identifying Disease Foci from Static and Dynamic Effective Connectivity Networks: Illustration in Soldiers with Trauma.* Human Brain Mapping, ePub 2017.

- S. Zhao, D. Rangaprakash, **A. Venkataraman**, P. Liang and G. Deshpande. *Investigating Focal Connectivity Deficits in Alzheimer's Disease using Directional Brain Networks Derived from Resting-State fMRI*. *Frontiers on Aging Neuroscience*, 9:1-12, 2017.
- S. van Noordt, J. Wu, **A. Venkataraman**, M.J. Larson, M. South and M.J. Crowley. *Inter-trial Coherence of Medial Frontal Theta Oscillations Linked to Differential Feedback Processing in High-Functioning Autism*. *Research in Autism Spectrum Disorders*, 37:1-10, 2017.
- A. Venkataraman**, D. Yang, N. Dvornek, L.H. Staib, J.S. Duncan, K.A. Pelphrey and P. Ventola. *Pivotal Response Treatment Prompts a Functional Rewiring of the Brain Among Individuals with Autism Spectrum Disorder*. *NeuroReport*, 27(14):1081-1085, 2016.
- D. Yang, K.A. Pelphrey, D.G. Sukhodolsky, M.J. Crowley, E. Dayan, N. Dvornek, **A. Venkataraman**, J.S. Duncan, L.H. Staib and P. Ventola. *Brain Responses to Biological Motion Predict Treatment Outcome in Young Children with Autism*. *Translational Psychiatry*, 6(11):e948 2016.
- A. Venkataraman**, D. Yang, K.A. Pelphrey and J.S. Duncan. *Bayesian Community Detection in the Space of Group-Level Functional Differences*. *IEEE Transactions Medical Imaging*, 35(8):1866-1882, 2016.
- A. Venkataraman**, J.S. Duncan, D. Yang and K.A. Pelphrey. *An Unbiased Bayesian Approach to Functional Connectomics Implicates Social-Communication Networks in Autism*. *NeuroImage Clin*, 8:356-366, 2015.
- A. Venkataraman**, M. Kubicki and P. Golland. *From Brain Connectivity Models to Region Labels: Identifying Foci of a Neurological Disorder*. *IEEE Transactions on Medical Imaging*, 32(11):2078-2098, 2013.
- A. Venkataraman**, T.J. Whitford, C-F. Westin, P. Golland and M. Kubicki. *Whole Brain Resting State Functional Connectivity Abnormalities in Schizophrenia*. *Schizophrenia Research*, 139(1-3):7-12, 2012.
- A. Venkataraman**, Y. Rathi, M. Kubicki, C-F. Westin and P. Golland. *Joint Modeling of Anatomical and Functional Connectivity for Population Studies*. *IEEE Trans on Medical Imaging*, 31(2):164-182, 2012.
- K.R.A. Van Dijk, T. Hedden, **A. Venkataraman**, K.C. Evans, S.W. Lazar and R.L. Buckner. *Intrinsic Functional Connectivity As a Tool For Human Connectomics: Theory, Properties, and Optimization*. *Journal of Neurophysiology*, 103(1):297-321, 2010.

PEER-REVIEWED CONFERENCE PROCEEDINGS

- J. Craley, E. Johnson, **A. Venkataraman**. *Integrating Convolutional Neural Networks and Probabilistic Graphical Modeling for Epileptic Seizure Detection in Multichannel EEG*. Submitted to IPMI: Information Processing in Medical Imaging, 2019.
- N.S. D'Souza, N. Wymbs, M.B. Nebel, S. Mostofsky and **A. Venkataraman**. *A Coupled Manifold Optimization Framework to Jointly Model the Functional Connectomics and Behavioral Data Spaces*. Submitted to IPMI: Information Processing in Medical Imaging, 2019.
- R. Shankar and **A. Venkataraman**. *Weakly Supervised Syllable Segmentation by Vowel-Consonant Peak Classification*. Submitted to ICASSP: IEEE Conference on Acoustics, Speech and Signal Processing, 2019.
- J. Sager, R. Shankar, J. Reinhold, and **A. Venkataraman**. *VESUS: A Crowd-Annotated Database to Study Emotion Production and Perception in Spoken English*. Submitted to ICASSP: IEEE Conference on Acoustics, Speech and Signal Processing, 2019.
- S. Ghosal, Q. Chen, A.L. Goldman, W. Ulrich, D.R. Weinberger, V.S. Mattay and **A. Venkataraman**. *A Generative-Predictive Framework to Capture Altered Brain Activity in fMRI and its Association with Genetic Risk: Application to Schizophrenia*. To Appear in SPIE Medical Imaging, 2019.
- N. Nandakumar, N.S. DSouza, J. Craley, K. Manzoor, J. Pillai, S. Gujar, H. Sair, **A. Venkataraman**. *Defining Patient Specific Functional Parcellations in Lesional Cohorts via Markov Random Fields*. In Proc. CNI: MICCAI Workshop on Connectomics in Neuroimaging, LNCS 11083:88-98, 2018.
Selected for an Oral Presentation (< 25% of Accepted Papers)

- N.S. D'Souza, N. Wymbs, M.B. Nebel, S. Mostofsky and **A. Venkataraman**. *A Generative-Discriminative Basis Learning Framework to Predict Clinical Severity from Resting State Functional MRI Data*. In Proc. MICCAI: International Conference on Medical Image Computing and Computer Assisted Intervention, LNCS 11072:163-171, 2018. **Selected for Early Acceptance (Top 15% of Submissions)**
- J. Craley, E. Johnson, **A. Venkataraman**. *A Novel Method for Epileptic Seizure Detection Using Coupled Hidden Markov Models*. In Proc. MICCAI: International Conference on Medical Image Computing and Computer Assisted Intervention, LNCS 11072:482-489, 2018.
Selected for Early Acceptance (Top 15% of Submissions)
- A. Venkataraman**, N. Wymbs, M.B. Nebel and S. Mostofsky. *A Unified Bayesian Approach to Extract Network-Based Functional Differences from a Heterogeneous Patient Cohort*. In Proc. CNI: MICCAI Workshop on Connectomics in NeuroImaging, LNCS 10511, pp. 60-69 2017.
Selected for an Oral Presentation (< 20% of Accepted Papers)
- N.C. Dvornek, D. Yang, **A. Venkataraman**, P. Ventola, L.H. Staib, K.A. Pelphrey and J.S. Duncan. *Prediction of Autism Treatment Response from Baseline fMRI using Random Forests and Tree Bagging*. In Proc. MICCAI Workshop on Multimodal Learning for Clinical Decision Support, pp. 1-8, 2016.
Selected for an Oral Presentation
- A. Venkataraman**, D. Yang, K.A. Pelphrey and J.S. Duncan. *Community Detection in the Space of Functional Abnormalities Reveals both Heightened and Reduced Brain Synchrony in Autism*. In Proc. BAMBI: MICCAI Workshop on Bayesian and Graphical Models for Biomedical Imaging, pp. 1-12, 2015.
Selected for an Oral Presentation
- A. Sweet*, **A. Venkataraman***, S.M. Stufflebeam, H. Liu, N. Tanaka and P. Golland. *Detecting Epileptic Regions Based on Global Brain Connectivity Patterns*. In Proc. MICCAI: International Conference on Medical Image Computing and Computer Assisted Intervention, LNCS 8149:98-105, 2013. **(Acceptance Rate \approx 30%)**
Selected for Oral Presentation (< 10% of Accepted Papers)
**equal contribution by first two authors*
- A. Venkataraman**, M. Kubicki and P. Golland. *From Brain Connectivity Models to Identifying Foci of a Neurological Disorder*. In Proc. MICCAI: International Conference on Medical Image Computing and Computer Assisted Intervention, LNCS 7510:697-704, 2012. **(Acceptance Rate \approx 30%)**
Selected for Oral Presentation (< 10% of Accepted Papers)
- A. Venkataraman**, Y. Rathi, M. Kubicki, C-F. Westin and P. Golland. *Joint Generative Model for fMRI/DWI and its Application to Population Studies*. In Proc. MICCAI: International Conference on Medical Image Computing and Computer Assisted Intervention, LNCS 6361:191-199, 2010. **(Acceptance Rate \approx 30%)**
Selected for Oral Presentation (< 10% of Accepted Papers)
- A. Venkataraman**, M. Kubicki, C-F. Westin and P. Golland. *Robust Feature Selection in Resting-State fMRI Connectivity Based on Population Studies*. In Proc. MMBIA: IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis: 63-70, 2010.
- A. Venkataraman**, K.R.A Van Dijk, R.L. Buckner and P. Golland. *Exploring Functional Connectivity in fMRI via Clustering*. In Proc. ICASSP: IEEE Conference on Acoustics, Speech and Signal Processing, 441-444, 2009.
- P. Golland, D. Lashkari and **A. Venkataraman**. *Spatial Patterns and Functional Profiles for Discovering Structure in fMRI Data*. In Proc. Asilomar Conf on Signals, Systems and Computers, 1402-1409, 2008.
- A. Venkataraman** and A.V. Oppenheim, *Signal Approximation using the Bilinear Transform*, In Proc. ICASSP: IEEE International Conference on Acoustics, Speech and Signal Processing, 3729-3732, 2008.

CONFERENCE ABSTRACTS

- N.S. D'Souza, M.B. Nebel, N. Wymbs, S. Mostofsky, **A. Venkataraman**. *A Generative-Discriminative Basis Learning Framework to Predict Autism Spectrum Disorder Severity*. In Proc. ISBI: International Symposium on Biomedical Imaging, 2018.

- N. Nandakumar, N.S. D'Souza, H. Sair, **A. Venkataraman**. *A Modified K-Means Algorithm for Resting State fMRI Analysis of Brain Tumor Patients, As Validated by Language Localization*. In Proc. ISBI: International Symposium on Biomedical Imaging, 2018.
- J. Craley, E. Johnson, **A. Venkataraman**. *Robust Seizure Detection Using Coupled Hidden Markov Models*. In Proc. ISBI: International Symposium on Biomedical Imaging, 2018.
- A. Venkataraman**, J.S. Duncan, D. Yang and K.A. Pelphrey. *Abnormal Functional Communities in Autism*. IMFAR: Intl Meeting For Autism Research, 2016.
Selected for Oral Presentation (< 5% of Abstracts)
- D. Rangaprakash, G. Deshpande, **A. Venkataraman**, J.S. Katz, T.S. Denney and M.N. Dretsch. *Identifying Foci of Brain Disorders from Effective Connectivity Networks*, ISMRM, 2016.
Received an Honorable Mention
- A. Venkataraman**, J.S. Duncan, D. Yang and K.A. Pelphrey. *An Unbiased Bayesian Approach to Functional Connectomics Implicates Social-Communication Networks in Autism*. In Proc. ISBI: International Symposium on Biomedical Imaging, 2015. **Invited Abstract and Presentation**
- S. Zhao, **A. Venkataraman**, P. Liang and G. Deshpande. *Investigating the Role of Brain Stem in Alzheimers Disease using Directional Brain Networks derived from Resting State fMRI*, Annual Mtg of ISMRM, 2015.
- A. Venkataraman**, M. Kubicki and P. Golland. *From Brain Connectivity Models to Identifying Foci of a Neurological Disorder*. 3rd Biennial Conference on Resting State Brain Connectivity, Sept 2012.
- A. Venkataraman**, K.R.A Van Dijk, R.L. Buckner and P. Golland. *Exploring Functional Connectivity in fMRI via Clustering*, Annual Meeting of the Organization of Human Brain Mapping, June 2009.

DISSERTATIONS

- A. Venkataraman**. *Generative Models of Brain Connectivity for Population Studies*. Doctor of Philosophy Thesis. Massachusetts Institute of Technology, Cambridge MA, 2012.
- A. Venkataraman**. *Signal Approximation Using the Bilinear Transform*. Masters of Engineering Thesis. Massachusetts Institute of Technology, Cambridge MA, 2007.

CURRENT & PAST RESEARCH SUPPORT

- NSF CRCNS 1822575** PI: Venkataraman 10/01/18 – 09/30/21
Discovering Network Structure in the Space of Group-Level Functional Differences
We will develop a robust mathematical framework to detect altered neural subsystems that track with a particular neurological disorder. We focus on three clinical testbeds: autism, ADHD and schizophrenia.
 Agency: National Science Foundation, CISE Directorate
 Total Funding Amount: \$874,048 over 3 years
- Neuroradiology MRI Scanning Award** Joint PI: Sair/Venkataraman/Johnson 07/01/17 – 06/31/18
Building a Database of Neurotypical Controls for Multiple Clinical Studies
We will collect rsfMRI data from a normative population using the research Siemens 3T scanner at JHMI. This dataset will serve as a resource for the Johns Hopkins community.
 Total Funding Amount: \$7,000 for 1 year
- JHMI Synergy Award** Joint PI: Johnson/Venkataraman 07/01/17 – 06/31/18
Epileptic Seizure Localization via Bayesian Structure Learning
We will develop a Bayesian structure learning framework to track the origin and progression of a focal epileptic seizure in the brain. We will validate our method on EEG data collected at the JHMI Epilepsy Monitoring Unit.
 Total Funding Amount: \$100,000 for 1 year

PENDING RESEARCH SUPPORT

NSF IIS Medium PI: Venkataraman 07/01/18 – 06/30/20
Engineering Perception: A Perturbation Model for Affective Speech
This project will develop a coupled emotion manipulation framework to fuse the recognition and synthesis viewpoints for affective speech. We will draw from reinforcement learning and computer vision to develop an action space of speech-to-speech perturbations and a scoring function to quantify emotional content.
Partner Institution: University of Southern California (Co-PIs: Shri Narayanan and Dani Byrd)
Agency: National Science Foundation, CISE Directorate
Total Funding Amount: \$1.2M over 4 years

NSF CAREER PI: Venkataraman 07/01/18 – 06/30/20
Small Data in a Big World: Balancing Interpretability and Generalizability for Data Integration in Clinical Neuroscience
This project develops a coupled network optimization framework that simultaneously extracts interpretable features from functional neuroimaging data and makes patient-specific predictions.
Agency: National Science Foundation, CISE Directorate
Total Funding Amount: \$500,000 over 5 years

NIH R21 PI: Venkataraman 04/01/19 – 03/31/21
A Unified Framework for Multimodal Neuroimaging Integration in a Heterogeneous Patient Cohort
This project combines static (MRI) and dynamic (EEG) imaging information with behavioral measures to capture the underlying neural mechanisms of neuropsychiatric disorders such as autism.
Agency: National Institute of Mental Health
Total Funding Amount: \$425,542 over 2 years

PUBLIC MENTIONS

- JHU Engineering Magazine (2018): *Your Brain on Engineering***
Article Summary: Researchers at Johns Hopkins use machine learning techniques to localize the source of epileptic seizures based on noninvasive EEG recordings. (*Correspondent: Christen Brownlee*)
- MIT News (2012): *Mapping Neurological Disease***
Article Summary: A new algorithm developed at MIT can analyze information from medical images to identify diseased areas of the brain and connections with other regions. (*Correspondent: Helen Knight*)

TECHNICAL PRESENTATIONS

Invited Talks

- 2018 **Bodian Distinguished Lecturer**, Mind Brain Institute, Johns Hopkins University
Mathematical Models for Functional Neuroimaging
Department of Applied Mathematics and Statistics, Johns Hopkins University
Generative Models to Decode Brain Pathology
NCCU Grand Rounds, Johns Hopkins Medical Institute
Automated Detection and Localization of Epileptic Seizures
Bay Area Entrepreneurs Meeting, Cupertino, CA
Mathematical Models to Decode the Brain
- 2017 **Distinguished Lecturer**, Institute for Computational Medicine, Johns Hopkins University
Keynote Speaker at the IEEE Joint Chapter Meeting, Rochester NY
University of Rochester, Department of Biomedical Engineering
Rochester Institute of Technology, Department of Electrical Engineering
UVA Charlottesville, Department of Electrical and Computer Engineering
An Adaptable Framework to Extract Abnormal Brain Networks

- 2016 UT San Antonio, Department of Electrical and Computer Engineering
Vanderbilt University, Department of Biomedical Engineering
University of Rochester, Department of Electrical Engineering,
Washington University, Department of Electrical Engineering and Systems Science
An Adaptable Framework to Extract Abnormal Brain Networks
- 2015 Johns Hopkins University, Department of Electrical and Computer Engineering
An Adaptable Framework to Extract Abnormal Brain Networks
International Symposium on Biomedical Imaging, Brooklyn NY
An Unbiased Bayesian Approach to Functional Connectomics Implicates Soc-Comm Networks in Autism
- 2014 Image Processing Conference at SPIE Medical Imaging, San Diego CA
Characterizing Abnormal Brain Networks
- 2013 MIT Institute of Medical Engineering and Science
Johns Hopkins University, Department of Electrical and Computer Engineering
UT Austin, Department of Electrical and Computer Engineering
Yale University, Department of Diagnostic Radiology
Characterizing Abnormal Brain Networks
- 2012 Laboratory for Mathematical Imaging, Brigham and Womens Hospital
MIT Rising Stars Workshop
From Brain Connectivity Models to Identifying Foci of a Neurological Disorder
MIT Lincoln Laboratory
MGH Martinos Center for Biomedical Imaging
Generative Models of Brain Connectivity for Population Studies
- 2011 Neurospin, Gif-sur-Yvette, France
Joint Modeling of Anatomical and Functional Connectivity for Population Studies

Conference and Workshop Oral Presentations

- 2017 CNI: MICCAI Workshop on Connectomics in Neuroimaging
Extracting Network-Based Functional Differences from a Heterogeneous Patient Cohort
- 2016 IMFAR: International Meeting for Autism Research
Abnormal Functional Communities in Autism
- 2015 Bayesian and graphical Models for Biomedical Imaging
Comm Detection in the Space of Func Abnormalities Reveals Abnormal Brain Synchrony in Autism
- 2013 International Conference on Medical Image Computing and Computer Assisted Intervention
Detecting Epileptic Regions Based on Global Brain Connectivity Patterns
- 2012 International Conference on Medical Image Computing and Computer Assisted Intervention
From Brain Connectivity Models to Identifying Foci of a Neurological Disorder
- 2010 International Conference on Medical Image Computing and Computer Assisted Intervention
Joint Generative Model for fMRI/DWI and its Application to Population Studies

Poster Presentations

- 2015 Yale Bioimaging Sciences Retreat Symposium
Bayesian Comm Detection in the Space of Group-Level Functional Differences
- 2012 3rd Biennial Conference on Resting State Brain Connectivity
From Brain Connectivity Models to Identifying Foci of a Neurological Disorder

- 2010 IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis
Robust Feature Selection in Resting-State fMRI Connectivity Based on Population Studies
- 2009 Annual Meeting of the Organization of Human Brain Mapping
IEEE International Conference on Acoustics, Speech and Signal Processing
Exploring Functional Connectivity in fMRI via Clustering
- 2008 IEEE International Conference on Acoustics, Speech and Signal Processing
Signal Approximation Using the Bilinear Transform
- 2005 Interconnect Focus Center Design Review, Atlanta, GA
An Integrated Low-Power Switched-Capacitor DC-DC Power Converter

TEACHING INITIATIVES

- Random Signals Analysis (520.651, JHU)** Fall 2016 – 2018
- Developed a core graduate course in probabilistic machine learning
 - Selected Topics: probability spaces, random variables, derived distributions, decision theory, parameter estimation, graphical models, EM algorithm, approximate inference techniques, Markov models, random sequences, Dirichlet processes, autoencoders
- Signal, Systems & Inference (520.313, JHU)** Spring 2018
- Developed a new advanced undergraduate course in ECE
 - Selected Topics: DTFT, Z-transforms, probability spaces, random variables, derived distributions, random processes, power spectral density, signal estimation, hypothesis testing, signal detection, state-space models
- Teaching Assistant, Information & Inference (6.437, MIT)** Spring 2011
- Graduate-level course satisfying TQE (technical qualifying evaluation) requirement
 - TA Responsibilities: teaching weekly recitation, writing and grading exams, compiling and distributing HW assignments, office hours
- Instructor, Eta Kappa Nu (MIT)** Intersession 2006
- Co-developed an introductory signals and systems course for underclassmen
 - Taught four classes, each one lasting for three hours

MENTORING ACTIVITIES

PhD Students

- Niharika Shimona D’Souza, ECE Sept 2016 – Present
- *MICCAI Travel Award Recipient (2018)*
- Jeff Craley, ECE June 2017 – Present
- Naresh Nandakumar, ECE Sept 2017 – Present
- Ravi Shankar, ECE Sept 2017 – Present
- Sayan Ghosal, ECE Sept 2017 – Present
- Pouria Tohidi, ECE Apr 2016 – Mar 2018
- Jacob Reinhold, ECE Aug 2017 – Jan 2018

Masters Students

- Rohan Nadkarni, BME Jan 2018 – Present
- *Co-advised with Charles Brown in Dept. of Anesthesiology*

Undergraduate Students

- Jacob Sager, ECE June 2016 – Present
- *William B. Huggins Fellowship Recipient (2017)*

- *NSF Research Experiences for Undergraduates Program*

UNIVERSITY SERVICE

Department of Electrical and Computer Engineering

ECE Curriculum Committee	2018 – Present
Distinguished Lecturer Committee	2016 – Present
Graduate Student Admissions	2017 – Present
Faculty Search Committee	2017 – 2018
Graduate Student Visit Day	2016 – 2017

Whiting School of Engineering

MINDS Faculty Search Committee	2018 – Present
WSE/DOM Research Retreat Committee	2018 – Present
Malone Center Strategic Planning Committee	2016 – Present
WSE Curriculum Committee	2016 – 2018
ChemBE Dept Head Search Committee	2017 – 2018
Malone Center Faculty Search Committee	2016 – 2017

Educational Service to Johns Hopkins University

Doctoral Thesis Committee Membership:

- Jeff Glaister (Expected May 2019)
Department: Electrical and Computer Engineering
Thesis Advisor: Jerry Prince
- Evan Schwab (Nov 2017)
Department: Electrical and Computer Engineering
Thesis: Joint Spatial-Angular Sparse Coding, Compressed Sensing, and Dictionary Learning for dMRI
Thesis Advisor: Rene Vidal

Masters Thesis Committee Membership:

- Carolina Pacheco (Aug 2018)
Department: Biomedical Engineering
Thesis: Recurrent Neural Nets for Classification of Human Embryonic Stem Cell-Derived Cardiomyocytes
Thesis Advisor: Rene Vidal

Graduate Board Exams Administered:

- Muhan Shao, ECE (Scheduled for Feb 2019)
- Wenying Wang, BME (April 2018)

ECE Qualifying Exams Administered:

- | | |
|---------------------------------|---------------------------------------|
| • Naresh Nandakumar (Aug 2018) | • Niharika Shimona D'Souza (Aug 2017) |
| • Ravi Shankar (Aug 2018) | • Yufan He (Aug 2017) |
| • Sayan Ghosal (Aug 2018) | • Muhan Shao (Aug 2017) |
| • Ranjani Srinivasan (Aug 2018) | • Mengnan Zhao (Aug 2017) |
| • Jacob Reinhold (Aug 2018) | • Nanxin Chen (Jan 2017) |
| • Yan Jiang (Jan 2018) | • Jaejin Cho (Jan 2017) |

PROFESSIONAL SERVICE ACTIVITIES

- 2019 NSF Reviewer: III Medium Informatics Panel (CISE Directorate)
Organizer for CNI: MICCAI Workshop on Connectomics in Neuroimaging
Area Chair for MIDL: Medical Imaging with Deep Learning
- 2018 NIH Reviewer: Neuroscience and Ophthalmic Imaging Technologies (NOIT) Study Section
Organizing Committee for the Rising Stars in Biomedical Workshop
Technical Program Committee, MICCAI Workshop on Connectomics in Neuroimaging
Session Chair, IEEE International Symposium on Biomedical Imaging
- 2017 Technical Program Committee, IEEE Conference on Information Sciences and Systems
Session Chair, Conference on Information Processing in Medical Imaging
- 2014 Editor for “Computational Diffusion MRI & Brain Connectivity”
Springer Mathematics & Visualization Series
- 2013 Organizer for the “Mathematical Models for Brain Connectivity” Workshop
Hosted as part of MICCAI: Medical Image Computing and Computer Assisted Intervention

Ongoing Reviewer for the Following Journal and Conferences:

- IEEE Transactions on Medical Imaging
- Medical Image Analysis (MedIA)
- NeuroImage
- NeuroImage: Clinical
- PLoS One
- MICCAI: Intl Conference on Medical Image Computing and Computer Assisted Intervention
- CVPR: IEEE Conference on Computer Vision and Pattern Recognition
- CISS: IEEE Conference on Information Sciences and Systems

PROFESSIONAL SOCIETY MEMBERSHIPS

MICCAI Society Member	2008 – Present
Siebel Scholar	2007 – Present
IEEE Member	2006 – Present
Tau Beta Pi, Engineering Honor Society	2006 – Present
Eta Kappa Nu, EE Honor Society	2006 – Present
National Society of Collegiate Scholars	2006 – Present

NON-PROFESSIONAL ACTIVITIES AND LEADERSHIP ROLES

Ashdown Residential Scholar Coordinator (MIT)	2009 – 2010
President, Ashdown House Executive Committee (MIT)	2008 – 2009
Boston Open Committee, International Badminton Tournament (Cambridge, MA)	2004 – 2008
Honor Society Chair Positions (MIT)	2006 – 2007
Treasurer and Co-Captain, MIT Badminton Club	2005 – 2006

REFERENCES

Polina Golland

Professor of Electrical Engineering and Computer Science
Massachusetts Institute of Technology
polina@csail.mit.edu
(617) 253-8005

James Duncan

Professor of Biomedical & Electrical Engineering and Diagnostic Radiology
Yale University
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(203) 785-6322

Kevin Pelphrey

Carbonell Family Professor & Director of the Autism and Neurodevelopmental Disorders Institute
George Washington University
kevinpelphrey@email.gwu.edu
(202) 994-0416

William Wells

Professor of Radiology
Harvard Medical School
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Xenophon Papademetris

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Yale University
xenophon.papademetris@yale.edu
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Hemant D. Tagare

Professor of Biomedical & Electrical Engineering and Diagnostic Radiology
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Martin Styner

Associate Professor of Psychiatry and Computer Science
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