Archana Venkataraman

3400 N Charles Street, Malone Hall 319
Baltimore, MD 21218-2608, United States

archana.venkataraman@jhu.edu
http://engineering.jhu.edu/nsa/

Education

Massachusetts Institute of Technology, Cambridge, MA

Ph.D., Electrical Engineering — 2007 – 2012
Thesis Title: Generative Models of Brain Connectivity for Population Studies
Thesis Supervisor: Polina Golland

M. Eng., Electrical Engineering — 2006 – 2007
Thesis Title: Signal Approximation using the Bilinear Transform
Thesis Supervisor: Alan V. Oppenheim

S.B., Electrical Engineering — 2003 – 2006
Concentration: Communications, Controls and Signal Processing

Academic and Research Positions

John C. Malone Assistant Professor, Johns Hopkins, Baltimore MD — 2016 – Present
Department of Electrical and Computer Engineering (Primary Appointment)
Department of Computer Science (Secondary Appointment)
Department of Applied Math and Statistics (Secondary Appointment)
Malone Center for Engineering in Healthcare (Core Faculty)
Mathematical Institute for Data Science (Core Faculty)
Center for Imaging Science (Core Faculty)

Postdoctoral Associate, Yale School of Medicine, New Haven CT — 2014 – 2016
Department of Diagnostic Radiology
Yale Image Processing and Analysis Group
Faculty Supervisor: James S. Duncan

Postdoctoral Fellow, MIT, Cambridge MA — 2012 – 2013
Department of Electrical Engineering and Computer Science
MIT Medical Vision Group
Faculty Supervisor: Polina Golland

Industry Experience

Technical Consultant, Vixiar Medical, Annapolis MD — 2018 – 2019

Intern, MIT Lincoln Laboratory, Lexington MA — June – Aug 2006
Advanced Sensor Techniques Group (103)
Supervisor: Dr. Andrew McKellips

Awards and Honors

Johns Hopkins University Catalyst Award	**2022**
NIH-MICCAI Faculty Travel Award	2021
Best Paper Award, SPIE Medical Imaging (Image Processing Conference)	2021
Best Paper Award, Machine Learning for Clinical Neuroimaging Workshop	2020
Elected to Full Membership in the Sigma Xi Honor Society	2020

Invited Participant, National Academy of Engineering FOE Symposium	2020
Invited Scholar, World Leader's Forum	2020
Best Paper Award, Connectomics for NeuroImaging Workshop	2019
MIT Technology Review: 35 Innovators Under 35	**2019**
NSF CAREER Award	**2019**
John C. Malone Assistant Professorship	**2017**
Council of Early Career Investigators in Imaging (CECI^2) Travel Award	2016
CHDI Grant, Network Models of Brain Connectivity for Huntington's Disease	2013 – 2014
MIT Lincoln Lab Campus Collaboration Award	2012 – 2014
NIH Advanced Multimodal Neuroimaging Training Program	2011 – 2012
MICCAI Student Travel Award ($500)	2010
National Defense Science and Engineering Graduate Fellowship (NDSEG)	**2007 – 2010**
Siebel Scholarship ($20,000)	**2007 – 2008**
MIT Provost Presidential Fellowship	**2006 – 2007**
Morris Joseph Levin Award, Best Thesis Presentation (M.Eng.)	**2007**
Asssociation of MIT Alumnae, Senior Academic Achievement Award ($500)	2006
Xerox Technical Minority Scholarship ($10,000)	2006
Maletta Foundation Scholarship, Rochester Engineering Society ($2500)	2005
Semiconductor Research Corporation Undergraduate Research Award ($18,000)	2004 – 2005
Xerox Technical Minority Scholarship ($2,500)	2004
National Merit Scholarship ($2,500)	2003

Trainee Awards and Honors

Naresh Nandakumar (PhD Student), MICCAI Travel Award	2022
Sarah Wu (Undergraduate), William B. Huggins Undergraduate Research Fellowship	2022
Yuta Kobayashi (Undergraduate), Michael J. Muuss Research Award	2022
Sayan Ghosal (PhD Student), Mathematical Institute for Data Science Fellowship	2022
Niharika Shimona D'Souza (PhD Student), Scholarship to attend the CMD-IT/ACM Richard Tapia Celebration of Diversity in Computing Conference	2021
Danielle Currey (Undergraduate), Michael J. Muuss Research Award	2021
Danielle Currey (Undergraduate), Outstanding Senior Award (Computer Science)	2021
Sayan Ghosal (PhD Student), Best Paper Award, SPIE Medical Imaging (Image Processing)	2021
Niharika Shimona D'Souza (PhD Student), Mathematical Institute for Data Science Fellowship	2021
Ravi Shankar (PhD Student), Mathematical Institute for Data Science Fellowship	2021
Naresh Nandakumar (PhD Student), Best Paper Award, ML for Clinical Neuroimaging Workshop	2020
Niharika Shimona D'Souza (PhD Student), Selected for the Rising Stars Program @ UChicago	2020
Niharika Shimona D'Souza (PhD Student), Selected for the Rising Stars Program @ UC Berkeley	2020
Sayan Ghosal (PhD Student), MICCAI Travel Award	2020
Niharika Shimona D'Souza (PhD Student), MICCAI Travel Award	2020
Ravi Shankar (PhD Student), Interspeech Travel Award	2020
Ravi Shankar (PhD Student), Mathematical Institute for Data Science Fellowship	2020
Naresh Nandakumar (PhD Student), Best Paper Award, Connectomics in Neuroimaging Workshop	2019
Jeff Craley (PhD Student), Finalist WSE/DOM Young Scientist Award	2019
Niharika Shimona D'Souza (PhD Student), IPMI Travel Award	2019
Niharika Shimona D'Souza (PhD Student), MICCAI Travel Award	2018
Jacob Sager (Undergraduate), William B. Huggins Undergraduate Research Fellowship	2018

Professional Service Activities

Editorial Responsibilities

Associate Editor, Frontiers in Neuroimaging - Analysis Methods	2021 – Present
Editorial Board, Journal of Imaging	2021 – Present
Handling Editor, OHBM Aperture	2020 – Present
Editorial Board Member, Medical Image Analysis	2019 – Present
Associate Editor, International Symposium on Biomedical Imaging (ISBI)	2022
Associate Editor, International Symposium on Biomedical Imaging (ISBI)	2021
Review Editor, *Brain Imaging Methods*, Frontiers of Neuroscience	2020
Editor, Connectomics in Neuroimaging, *Springer MICCAI Workshops Series, ShenZhen, China*	2019
Editor, Computational Diffusion MRI and Brain Connectivity *Springer Mathematics & Visualization Series*	2014

Grant Reviewing Activities

2022 NIH Reviewer: Voice, Speech and Language Fellowship (F/K Series)

2021 Panelist: Aligning Science Across Parkinson's (Michael J. Fox Foundation)

2020 NSF Panelist: CAREER Panel (CISE Directorate)
NSF Panelist: Collaborative Research in Computational Neuroscience (CISE Directorate)

2019 NSF Panelist: CAREER Panel (CISE Directorate)
NSF Ad-Hoc Reviewer: III Small Informatics Panel (CISE Directorate)
NSF Panelist: Collaborative Research in Computational Neuroscience (CISE Directorate)
NSF Panelist: III Medium Informatics Panel (CISE Directorate)

2018 NIH Reviewer: Neuroscience and Ophthalmic Imaging Technologies (NOIT) Study Section

Conference and Workshop Organization

2025 (Upcoming) Program Chair, Medical Image Computing and Computer Assisted Intervention (MICCAI)

2023 Paper Selection Committee, Information Processing in Medical Imaging (IPMI)
Career Development WG, Medical Image Computing and Computer Assisted Intervention (MICCAI)
Program Committee, IEEE EMBS Conference on Neural Engineering

2022 Program Chair, Medical Imaging with Deep Learning (MIDL)
Program Committee, IEEE International Symposium on Biomedical Imaging (ISBI)

2021 Co-Director of the 55^{th} Annual Conference on Information Sciences and Systems (CISS)
Sponsored by the IEEE Information Theory Society
Program Committee, IEEE International Symposium on Biomedical Imaging (ISBI)
Area Chair, Medical Image Computing and Computer Assisted Intervention (MICCAI)
Best Paper Award Committee, Medical Imaging with Deep Learning (MIDL)

2020 Organizer, Asilomar Invited Session: *From Neural Networks to Neural Systems: Using AI to Decode the Brain in Health and Disease*
Area Chair, Medical Image Computing and Computer Assisted Intervention (MICCAI)
Session Chair, Medical Image Computing and Computer Assisted Intervention (MICCAI)
Faculty Mentor, Medical Image Computing and Computer Assisted Intervention (MICCAI)

2019 Organizer, CNI: MICCAI Workshop on Connectomics in Neuroimaging
Organizer, CISS Invited Session: Mathematical Models to Decode the Brain
Area Chair, Medical Image Computing and Computer Assisted Intervention (MICCAI)
Area Chair, Medical Imaging with Deep Learning (MIDL)
Session Chair, Conference on Information Processing in Medical Imaging (IPMI)

2018 Organizing Committee, 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

2013 Organizer, MMBC: MICCAI Workshop on Mathematical Models for Brain Connectivity

Conference and Journal Reviewing Activities

Frontiers in Neuroscience	2019 – Present
NeuroImage: Clinical	2017 – Present
NeuroImage	2015 – Present
IEEE Transactions on Medical Imaging	2013 – Present
Medical Image Analysis	2013 – Present
IEEE Transactions on Neural Systems and Rehabilitation	2018 – 2019
Journal of Selected Topics in Signal Processing	2017 – 2018
Public Library of Science (PLoS) One	2016 – 2017
MICCAI Workshop on Machine Learning for Clinical Neuroimaging	2022
MICCAI: Medical Image Computing and Computer Assisted Intervention	2012 – 2018, 2022
Information Processing in Medical Imaging	2021
NeurIPS: Neural Information Processing Systems	2019 – 2020
Rated by the program committee among the Top 5% of Reviewers in 2019	
CISS: IEEE Conference on Information Sciences and Systems	2017
CVPR: IEEE Conference on Computer Vision and Pattern Recognition	2010

Book Chapters and Volumes

[B1] N.S. D'Souza and **A. Venkataraman**. *Network Comparisons for Connectomics.* Connectomics Analysis, Eds. M.D. Schirmer, A. Wern Chung, T. Arichi, Elsevier Academic Press, In Press, 2023.

[B2] M.D. Schirmer, **A. Venkataraman**, I. Rekik, M. Kim, A. Wern Chung (Eds.). *Connectomics in NeuroImaging: MICCAI Workshops, ShenZhen, China*, October 2019.

[B3] **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, P. Laurienti, Elsevier Academic Press, 2018.

[B4] T. Schultz, G. Nedjati-Gilani, **A. Venkataraman**, L. O'Donnell, E. Panagiotaki (Eds.). *Computational Diffusion MRI and Brain Connectivity: MICCAI Workshops, Nagoya, Japan*, January 2014.

Submitted Papers Under Review or Revision

[S1] R. Shankar, A. Kenfack, A. Somayazulu, **A. Venkataraman**. *A Comprehensive Study of Augmentation Techniques for Deep-Learning based Speech Emotion Recognition.* Under Review for ICASSP, 2023.

[S2] R. Shankar and **A. Venkataraman**. *Adaptive Rhythm Modification of Speech using Masked Convolutional Networks and Open-Loop Time Warping.* Under Review for ICASSP, 2023.

[S3] N.S.D'Souza and **A. Venkataraman**. *Geo-NN: An End-to-End Framework for Geodesic Mean Estimation on the Manifold of Symmetric Positive Definite Matrices.* Under Review for ICLR, 2023.

[S4] D. Currey, J. Craley, D. Hsu, R. Ahmed, **A. Venkataraman**. *EPViz: A Flexible and Lightweight Visualizer to Facilitate Predictive Modeling for Multi-channel EEG.* Under Review for PLoS One, 2022.

Underlined names correspond to my trainees.

Journal Articles

[J1] B. Tang, Y. Zhao, **A. Venkataraman**, K. Tsapkini, M. Lindquist, J. Pekar, B. Caffo. *Changes in Functional Connectivity after Transcranial Direct-Current Stimulation: A Connectivity Density Point of View.* Human Brain Mapping, In Press, 2022. *[Impact Factor 5.04; 2022]*

[J2] S. Bakas et al. (>50 authors) *Federated Learning Enables Big Data for Rare Cancer Boundary Detection.* Nature Medicine, In Press, 2022. *[Impact Factor 53.44; 2022]*

[J3] R. Shankar, H.-W. Hsieh, N. Charon, **A. Venkataraman**. *A Diffeomorphic Flow-based Variational Framework for Multi-speaker Emotion Conversion.* IEEE Transactions on Audio, Speech, and Language Processing, In Press, 2022. *[Impact Factor 3.92; 2022]*

[J4] N. Nandakumar, D. Hsu, R. Ahmed, **A. Venkataraman**. *DeepSOZ: A Graph Convolutional Network for Automated Seizure Onset Zone Localization from Resting-State fMRI Connectivity.* IEEE Transactions on Biomedical Engineering, In Press, 2022. *[Impact Factor 4.54; 2021-22]*

[J5] J. Craley, C. Jouny, E. Johnson, R. Ahmed, D. Hsu, **A. Venkataraman**. *Automated Seizure Activity Tracking and Onset Zone Localization from Scalp EEG using Deep Neural Networks.* PLoS One, 17(2): e0264537, 2022. *[Impact Factor 3.24; 2021-22]*

[J6] N.S. D'Souza, M.B. Nebel, D. Crocetti, J. Robinson, N. Wymbs, S. Mostofsky, **A. Venkataraman**. *Deep sr-DDL: Deep Structurally Regularized Dynamic Dictionary Learning to Integrate Multimodal and Dynamic Functional Connectivity for Multidimensional Clinical Characterizations.* NeuroImage, 241:118388, 2021. *[Impact Factor 6.56; 2021]*

[J7] Y. Kobayashi*, A. Bukowski*, S. Das*, N. Wagle, S. Bakshi, M. Saha, J. Kaltschmidt†, **A. Venkataraman**†, S. Kulkarni†. *COUNTEN, an AI-Driven Tool for Rapid and Objective Structural Analyses of the Enteric Nervous System.* eNeuro, 8(4):1-6, 2021. *[Impact Factor 3.44; 2021]*
* *Joint first authorship* † *Joint senior authorship*

[J8] N. Nandakumar, K. Manzoor, S. Agarwal, J. Pillai, S. Gujar, H. Sair, **A. Venkataraman**. *Automated Eloquent Cortex Localization in Brain Tumor Patients Using Multi-task Graph Neural Networks.* Medical Image Analysis (MedIA), 74:102203, 2021. *[Impact Factor 8.55; 2021]*

[J9] S. Ghosal, Q. Chen, G. Pergola, A.L. Goldman, W. Ulrich, K.F. Berman, A. Rampino, G. Blasi, L. Fazio, A. Bertolino, D.R. Weinberger, V.S. Mattay, **A. Venkataraman**. *A Generative Discriminative Framework that Integrates Imaging, Genetic, and Diagnosis into Coupled Low Dim Space.* NeuroImage, 238:118200, 2021. *[Impact Factor 6.56; 2021]*

[J10] M.D. Schirmer, **A. Venkataraman**, I. Rekik, M. Kim, S. Mostofsky, M.B. Nebel, K. Rosch, K. Seymour, D. Crocetti, H. Irzan, M. Hutel, S. Ourselin, N. Marlow, A. Melbourne, E. Levchenko, S. Zhou, M. Kunda, H. Lu, N.C. Dvornek, J. Zhuang, G. Pinto, S. Samal, J.L. Bernal-Rusiel, R. Pienaar, A. Wern Chung. *Neuropsychiatric Disease Classification Using Functional Connectomics – Results of the Connectomics in NeuroImaging Transfer Learning Challenge*, Medical Image Analysis (MedIA), 70:101972, 2021. *[Impact Factor 8.55; 2021]*

[J11] J. Craley, C. Jouny, E. Johnson, **A. Venkataraman**. *Automated Inter-Patient Seizure Detection Using Multichannel Convolutional and Recurrent Neural Networks.* Journal of Biomedical Signal Processing and Control, 64:102360, 2021 (Online 2020). *[Impact Factor 3.88; 2021]*

[J12] X. Liu, K. Akiyoshi, M. Nakano, K. Brady, B. Bush, R. Nandkarni, **A. Venkataraman**, R.C. Koehler, J.K. Lee, C.W. Hogue, M. Czosnyka, P. Smielewski, C.H. Brown. *Determining Thresholds for Three Indices of Autoregulation to Identify the Lower Limit of Autoregulation During Cardiac Surgery.* Journal of Critical Care Medicine, 49(4):650-660, 2021 (Online 2020). *[Impact Factor 7.60; 2021]*

[J13] N.S. D'Souza, N. Wymbs, M.B. Nebel, S. Mostofsky, **A. Venkataraman**. *A Joint Network Optimization Framework to Predict Clinical Severity from Resting State fMRI Data.* NeuroImage, 206:116314, 2020. *[Impact Factor 6.82; 2020]*

[J14] J. Craley, E. Johnson, **A. Venkataraman**. *A Spatio-Temporal Model of Seizure Propagation in Focal Epilepsy.* IEEE Transactions on Medical Imaging, 39(5):1404-1418, 2020. (Online 2019) *[Impact Factor 13.94; 2020]*

[J15] D. Rangaprakash, M.N. Dretsch, **A. Venkataraman**, J.S. Katz, T.S. Denney Jr., G. Deshpande. *Identifying Disease Foci from Static and Dynamic Effective Connectivity Networks: Illustration in Soldiers with Trauma.* Human Brain Mapping, 39(1):264-287, 2018. *[Impact Factor 4.55; 2018]*

[J16] S. Zhao, D. Rangaprakash, **A. Venkataraman**, P. Liang, 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. *[Impact Factor 3.63; 2017]*

[J17] S. van Noordt, J. Wu, **A. Venkataraman**, M.J. Larson, M. South, 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. *[Impact Factor 1.70; 2017]*

[J18] **A. Venkataraman**, D. Yang, N. Dvornek, L.H. Staib, J.S. Duncan, K.A. Pelphrey, P. Ventola. *Pivotal Response Treatment Prompts a Functional Rewiring of the Brain Among Individuals with Autism Spectrum Disorder.* NeuroReport, 27(14):1081-1085, 2016. *[Impact Factor 1.27; 2016]*

[J19] D. Yang, K.A. Pelphrey, D.G. Sukhodolsky, M.J. Crowley, E. Dayan, N. Dvornek, **A. Venkataraman**, J.S Duncan, L.H. Staib, P. Ventola *Brain Responses to Biological Motion Predict Treatment Outcome in Young Children with Autism.* Translational Psychiatry, 6(11):e948 2016. *[Impact Factor 5.13; 2016]*

[J20] **A. Venkataraman**, D. Yang, K.A. Pelphrey, J.S. Duncan. *Bayesian Community Detection in the Space of Group-Level Functional Differences.* IEEE Transactions Medical Imaging, 35(8):1866-1882, 2016. *[Impact Factor 4.85; 2016]*

[J21] **A. Venkataraman**, J.S. Duncan, D. Yang, K.A. Pelphrey. *An Unbiased Bayesian Approach to Functional Connectomics Implicates Social-Communication Networks in Autism.* NeuroImage: Clinical, 8:356-366, 2015. *[Impact Factor 3.86; 2015]*

[J22] **A. Venkataraman**, M. Kubicki, 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. *[Impact Factor 5.28; 2013]*

[J23] **A. Venkataraman**, T.J. Whitford, C-F. Westin, P. Golland, M. Kubicki. *Whole Brain Resting State Functional Connectivity Abnormalities in Schizophrenia.* Schizophrenia Research, 139(1-3):7-12, 2012. *[Impact Factor 4.59; 2012]*

[J24] **A. Venkataraman**, Y. Rathi, M. Kubicki, C-F. Westin, P. Golland. *Joint Modeling of Anatomical and Functional Connectivity for Population Studies.* IEEE Transactions on Medical Imaging, 31(2):164-182, 2012. *[Impact Factor 5.80; 2012]*

[J25] K.R.A. Van Dijk, T. Hedden, **A. Venkataraman**, K.C. Evans, S.W. Lazar, R.L. Buckner. *Intrinsic Functional Connectivity As a Tool For Human Connectomics: Theory, Properties, and Optimization.* Journal of Neurophysiology, 103(1):297-321, 2010. *[Impact Factor 3.11; 2010]*

Peer-Reviewed Conference Proceedings

[C1] N. Nandakumar, K. Manzoor, S. Agarwal, H. Sair, **A. Venkataraman**. *RefineNet: An Automated Framework to Generate Task and Subject-Specific Brain Parcellations for Resting-State fMRI Analysis.* To Appear in MICCAI, 2022. **[Acceptance Rate ≈ 30%] – Early Acceptance (Top 13% of Submissions)**

[C2] J. Craley, E. Johnson, C. Jouny, D. Hsu, R. Ahmed, **A. Venkataraman**. *SZLoc: A Multi-resolution Architecture for Automated Epileptic Seizure Localization from Scalp EEG.* In Proc. MIDL: Medical Imaging with Deep Learning, pp. 1-21, 2022.

[C3] S. Ghosal, Q. Chen, G. Pergola, A.L. Goldman, W. Ulrich, D.R. Weinberger, **A. Venkataraman**. *A Biologically Interpretable Graph Convolutional Network to Link Genetic Risk Propagations and Imaging Biomarkers of Disease.* In Proc. ICLR: International Conference on Learning Representations, pp. 1-18, 2022. **[Acceptance Rate ≈ 30%]**

[C4] N.S. D'Souza, M.B. Nebel, D. Crocetti, N. Wymbs, J. Robinson, S. Mostofsky, **A. Venkataraman**. *A Matrix Auto-encoder Framework to Align the Functional and Structural Connectivity Manifolds as Guided by Behavioral Phenotypes.* In Proc. MICCAI: Medical Image Computing and Computer Assisted Intervention, LNCS 12907:625-636, 2021. **[Acceptance Rate ≈ 30%]**

[C5] N.S. D'Souza, M.B. Nebel, D. Crocetti, N. Wymbs, J. Robinson, S. Mostofsky, **A. Venkataraman**. *M-GCN: A Multimodal Graph Convolutional Network to Integrate Functional and Structural Connectomics Data to Predict Multidimensional Phenotypic Characterizations.* In Proc. MIDL: Medical Imaging with Deep Learning, PMLR 143:119-130, 2021. **Selected for a Long Oral Presentation (<15% of Accepted Papers)**

[C6] N. Nandakumar, K. Manzoor, S. Agarwal, J. Pillai, S. Gujar, H. Sair, **A. Venkataraman**. *A Multi-Scale Spatial and Temporal Attention Network on Dynamic Connectivity to Localize the Eloquent Cortex in Brain Tumor Patients.* In Proc. IPMI: Information Processing in Medical Imaging, LNCS 12729:241-252, 2021. **[Acceptance Rate ≈ 30%]**

[C7] Y. Peng, N.S. D'Souza, B. Bush, C. Brown, **A. Venkataraman**. *Predicting Acute Kidney Injury via Interpretable Ensemble Learning and Attention Weighted Convoutional–Recurrent Neural Networks.* In Proc. Conference on Information Sciences and Systems (CISS), pp. 1-6, 2021.

[C8] D. Currey, D. Hsu, R. Ahmed, **A. Venkataraman**, J. Craley. *Cross-Site Epileptic Seizure Detection Using Convolutional Neural Networks.* In Proc. Conf on Information Sciences and Systems (CISS), pp. 1-6, 2021.

[C9] S. Ghosal, Q. Chen, G. Pergola, A.L. Goldman, W. Ulrich, K.F. Berman, A. Rampino, G. Blasi, L. Fazio, A. Bertolino, D.R. Weinberger, V.S. Mattay, **A. Venkataraman**. *G-MIND: An End-to-End Multimodal Imaging-Genetics Framework for Biomarker Identification and Disease Classification.* In Proc. SPIE, vol.11596, 2021. **Selected for an Oral Presentation (<15% of Accepted Papers) - Best Paper Award**

[C10] N. Nandakumar, N.S. D'Souza, K. Manzoor, J. Pillai, S. Gujar, S. Agarwal, H. Sair, **A. Venkataraman**. *A Multi-Task Deep Learning Framework to Localize the Eloquent Cortex in Brain Tumor Patients using Both Static and Dynamic Functional Connectivity.* In Proc. MLCN: MICCAI Workshop on Machine Learning for Clinical Neuroimaging, LNCS 12449:34-44, 2020. **Selected for an Oral Presentation - Best Paper Award**

[C11] N.S. D'Souza, M.B. Nebel, D. Crocetti, N. Wymbs, J. Robinson, S. Mostofsky, **A. Venkataraman**. *A Deep-Generative Hybrid Model to Integrate Multimodal and Dynamic Connectivity for Predicting Spectrum-Level Deficits in Autism.* In Proc. MICCAI: Medical Image Computing and Computer Assisted Intervention, LNCS 12267:437-447, 2020. **[Acceptance Rate ≈ 30%]**

[C12] R. Shankar, H.-W. Hsieh, N. Charon, **A. Venkataraman**. *Multispeaker Emotion Conversion via a Chained Encoder-Decoder-Predictor Network and Latent Variable Regularization.* In Proc. Interspeech: Conference of the International Speech Communication Association, pp. 3391-3395, 2020.

[C13] R. Shankar, J. Sager, **A. Venkataraman**. *Non-parallel Emotion Conversion using a Pair Discrimination Deep-Generative Hybrid Model.* In Proc. Interspeech: Conference of the International Speech Communication Association, pp. 3396-3400, 2020.

[C14] N. Nandakumar, K. Manzoor, J. Pillai, S. Gujar, H. Sair, **A. Venkataraman**. *A Novel Graph Neural Network to Localize Eloquent Cortex in Brain Tumor Patients from Resting-State fMRI Connectivity.* In Proc. CNI: MICCAI Workshop on Connectomics in Neuroimaging, LNCS 11848:10-20, 2019.
Selected for an Oral Presentation (< 25% of Accepted Papers) - Best Paper Award

[C15] R. Shankar, J. Sager, **A. Venkataraman**. *A Multi-Speaker Emotion Morphing Model Using Highway Networks and Maximum Likelihood Objective.* In Proc. Interspeech: Conf of the International Speech Communication Association, pp. 2848-2852, 2019. **Selected for an Oral Presentation (<20% of Accepted Papers)**

[C16] J. Sager, J. Reinhold, R. Shankar, **A. Venkataraman**. *VESUS: A Crowd-Annotated Database to Study Emotion Production and Perception in Spoken English.* In Proc. Interspeech: Conf of the Intl Speech Communication Association, pp. 316-320, 2019. **Selected for an Oral Presentation (<20% of Accepted Papers)**

[C17] R. Shankar, H.-W. Hsieh, N. Charon, **A. Venkataraman**. *Automated Emotion Morphing in Speech Based on Diffeomorphic Curve Registration and Highway Networks.* In Proc. Interspeech: Conference of the International Speech Communication Association, pp. 4499-4503, 2019.

[C18] R. Shankar and **A. Venkataraman**. *Weakly Supervised Syllable Segmentation by Vowel-Consonant Peak Classification.* In Proc. Interspeech: Conf of the Intl Speech Communication Association, pp. 644-648, 2019.

[C19] J. Craley, C. Jouny, E. Johnson, **A. Venkataraman**. *Automated Noninvasive Seizure Detection and Localization Using Switching Markov Models and Convolutional Neural Networks.* In Proc. MICCAI: International Conference on Medical Image Computing and Computer Assisted Intervention, LNCS 11767:253-262, 2019. **[Acceptance Rate ≈ 30%] – Early Acceptance (Top 18% of Submissions)**

[C20] S. Ghosal, Q. Chen, A.L. Goldman, W. Ulrich, K.F. Berman, D.R. Weinberger, V.S. Mattay, **A. Venkataraman**. *Bridging Imaging, Genetics, and Diagnosis in a Coupled Low-Dimensional Framework.* In Proc. MICCAI: International Conference on Medical Image Computing and Computer Assisted Intervention, LNCS 11767:647-655, 2019. **[Acceptance Rate ≈ 30%] – Early Acceptance (Top 18% of Submissions)**

[C21] N.S. D'Souza, N. Wymbs, M.B. Nebel, S. Mostofsky, **A. Venkataraman**. *Integrating Neural Networks and Dictionary Learning for Multidimensional Clinical Characterizations from Functional Connectomics Data.* In Proc. MICCAI: International Conference on Medical Image Computing and Computer Assisted Intervention, LNCS 11766:709-717, 2019. **[Acceptance Rate ≈ 30%]**

[C22] J. Craley, E. Johnson, **A. Venkataraman**. *Integrating Convolutional Neural Networks and Probabilistic Graphical Modeling for Epileptic Seizure Detection in Multichannel EEG.* In Proc. IPMI: Information Processing in Medical Imaging, LNCS 11492:291-303, 2019. **[Acceptance Rate ≈ 30%] – Oral Presentation**

[C23] N.S. D'Souza, N. Wymbs, M.B. Nebel, S. Mostofsky, **A. Venkataraman**. *A Coupled Manifold Optimization Framework to Jointly Model the Functional Connectomics and Behavioral Data Spaces.* In Proc. IPMI: Information Processing in Medical Imaging, LNCS 11492:605-616,2019. **[Acceptance Rate ≈ 30%]**

[C24] S. Ghosal, Q. Chen, A.L. Goldman, W. Ulrich, D.R. Weinberger, V.S. Mattay, **A. Venkataraman**. *A Generative-Predictive Framework to Capture Altered Brain Activity in fMRI and its Association with Genetic Risk: Application to Schizophrenia.* SPIE Medical Imaging, vol. 10949, 2019.

[C25] N. Nandakumar, N.S. D'Souza, 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)

[C26] N.S. D'Souza, N. Wymbs, M.B. Nebel, S. Mostofsky, **A. Venkataraman**. *A Generative-Discriminative Basis Learning Framework to Predict Clinical Severity from Resting State Functional MRI Data.* In Proc. MICCAI: Intl Conference on Medical Image Computing and Computer Assisted Intervention, LNCS 11072:163-171, 2018. **[Acceptance Rate ≈ 30%] – Selected for Early Acceptance (Top 15% of Submissions)**

[C27] 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. **[Acceptance Rate ≈ 30%]**
Selected for Early Acceptance (Top 15% of Submissions)

[C28] **A. Venkataraman**, N. Wymbs, M.B. Nebel, 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)

[C29] N.C. Dvornek, D. Yang, **A. Venkataraman**, P. Ventola, L.H. Staib, K.A. Pelphrey, 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 Supp, pp. 1-8, 2016. **– Oral Presentation**

[C30] **A. Venkataraman**, D. Yang, K.A. Pelphrey, 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. **– Oral Presentation**

[C31] A. Sweet†, **A. Venkataraman**†, S.M. Stufflebeam, H. Liu, N. Tanaka, 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 ≈ 30%]**
Selected for an Oral Presentation (< 10% of Accepted Papers)
† *Joint first authorship (equal contributions)*

[C32] **A. Venkataraman**, M. Kubicki, 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 ≈ 30%]**
Selected for an Oral Presentation (< 10% of Accepted Papers)

[C33] **A. Venkataraman**, Y. Rathi, M. Kubicki, C-F. Westin, 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 ≈ 30%]**
Selected for Oral Presentation (< 10% of Accepted Papers)

[C34] **A. Venkataraman**, M. Kubicki, C-F. Westin, 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.

[C35] **A. Venkataraman**, K.R.A Van Dijk, R.L. Buckner, P. Golland. *Exploring Functional Connectivity in fMRI via Clustering*. In Proc. ICASSP: IEEE Conference on Acoustics, Speech and Signal Proc, 441-444, 2009.

[C36] P. Golland, D. Lashkari, **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.

[C37] **A. Venkataraman**, A.V. Oppenheim, *Signal Approximation using the Bilinear Transform*, In Proc. ICASSP: IEEE Conference on Acoustics, Speech and Signal Processing, 3729-3732, 2008.

Working Papers and Preprints

[W1] Y. Kobayashi*, Y. Peng*, B. Bush, Y.-H. Jung, L. Goeddel, G. Whitman, **A. Venkataraman**†, C.H. Brown†. *Prediction of Lactate Concentrations after Cardiac Surgery Using Machine Learning and Deep Learning Approaches*, In Preparation, 2022.
* *Joint first authorship* † *Joint senior authorship*

[W2] The Future Learning Collective (>50 authors) *Prospective Learning: Back to the Future*. In Preparation, 2023.

Conference Abstracts

[A1] S. Ghosal, Qiang Chen, Giulio Pergola, A.L. Goldman, W. Ulrich, D. Weinberger, **A. Venkataraman**. *A Biologically Interpretable Graph Convolutional Network to Link Genetic Risk Pathways and Imaging Phenotypes of Disease*. NSF CRCNS PI Meeting, GA, 2022.

[A2] D. Currey, J. Craley, D. Hsu, R. Ahmed, **A. Venkataraman**. *EPViz: A Flexible and Lightweight Visualizer to Facilitate Predictive Modeling for Multi-channel EEG*. American Epilepsy Society Annual Meeting, 2021.

[A3] J. Craley, C. Jouny, E. Johnson, Raheel Ahmed, David Hsu, **A. Venkataraman**. *GraphTrack: Automated Seizure Detection and Tracking in Scalp EEG Recordings*. American Epilepsy Society Annual Meeting, 2021.

[A4] S. Ghosal, Q. Chen, G. Pergola, D. Weinberger, **A. Venkataraman**. *An End-to-End Multimodal Imaging-Genetics Framework for Biomarker Identification and Disease Classification*. Asilomar Invited Session: From Neural Networks to Neural Systems: Using AI to Decode the Brain in Health and Disease, 2020.

[A5] N.S. D'Souza, M.B. Nebel, N. Wymbs, S. Mostofsky, **A. Venkataraman**. *A Joint Network Optimization Framework to Predict Clinical Severity from Resting-State Functional MRI Data*. Second International Conference on Medical Imaging and Case Reports, 2019. **Invited Abstract and Presentation**

[A6] N.S. D'Souza, M.B. Nebel, N. Wymbs, S. Mostofsky, **A. Venkataraman**. *A Joint Network Optimization Framework to Predict Clinical Severity from Resting-State Functional Connectomics*. Flux Congress, 2019.

[A7] **A. Venkataraman**, N.S. D'Souza, M.B. Nebel, N. Wymbs, S. Mostofsky. *Predicting Behavior from Resting-State fMRI Connectivity*. In Proc. SAND9: Statistical Analysis of Neuronal Data, 2019.
Selected for a Young Investigator Spotlight Presentation

[A8] 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.

[A9] 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.

[A10] J. Craley, E. Johnson, **A. Venkataraman**. *Robust Seizure Detection Using Coupled Hidden Markov Models.* In Proc. ISBI: International Symposium on Biomedical Imaging, 2018.

[A11] **A. Venkataraman**, J.S. Duncan, D. Yang, K.A. Pelphrey. *Abnormal Functional Communities in Autism.* IMFAR: Intl Meeting For Autism Research, 2016. **Oral Presentation (< 5% of Abstracts)**

[A12] D. Rangaprakash, G. Deshpande, **A. Venkataraman**, J.S. Katz, T.S. Denney, M.N. Dretsch. *Identifying Foci of Brain Disorders from Effective Connectivity Networks*, ISMRM, 2016. **Honorable Mention**

[A13] **A. Venkataraman**, J.S. Duncan, D. Yang, 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**

[A14] S. Zhao, **A. Venkataraman**, P. Liang, G. Deshpande. *Investigating the Role of Brain Stem in Alzheimer's Disease using Directional Brain Networks derived from Resting State fMRI*, Annual Mtg of ISMRM, 2015.

[A15] **A. Venkataraman**, M. Kubicki, P. Golland. *From Brain Connectivity Models to Identifying Foci of a Neurological Disorder.* 3^{rd} Biennial Conference on Resting State Brain Connectivity, Sept 2012.

[A16] **A. Venkataraman**, K.R.A Van Dijk, R.L. Buckner, P. Golland. *Exploring Functional Connectivity in fMRI via Clustering*, Annual Meeting of the Organization of Human Brain Mapping, June 2009.

Dissertations

[D1] **A. Venkataraman**. *Generative Models of Brain Connectivity for Population Studies.* Doctor of Philosophy Thesis. Massachusetts Institute of Technology, Cambridge MA, 2012.

[D2] **A. Venkataraman**. *Signal Approximation Using the Bilinear Transform.* Masters of Engineering Thesis. Massachusetts Institute of Technology, Cambridge MA, 2007.

Open-Source Data and Software

The Varied Emotion in Syntactically Uniform Speech (VESUS) Dataset

VESUS is a lexically controlled dataset of parallel emotional speech utterances. VESUS contains 252 distinct phrases, each read by 10 actors in 5 emotional states (neutral, angry, happy, sad, fearful). Using Amazon Mechanical Turk, we obtain 10 crowd-sourced ratings for each utterance to determine the perceived emotional content. In total, VESUS contains over 6 hours of pure speech and over 10,000 emotional annotations.

The EEG Prediction Visualizer (EPViz)

EPViz is a lightweight and standalone software package to aid researchers in developing, validating, and reporting their predictive modeling outputs. Developed in Python, EPViz allows researchers to load a PyTorch deep learning model, apply it to the EEG, and overlay the output channel-wise or subject-level temporal predictions on top of the original EEG time series. These results can be saved as high-resolution images for use in manuscripts and presentations. EPViz also provides valuable tools for clinician-scientists, including spectrum visualization, computation of basic data statistics, and annotation editing.

The EDF Anonymizer

This tool is designed to facilitate the sharing of clinical EEG data. It provides a graphical interface for the user to alter header fields in a standard EDF file; it also provides default settings for scrubbing patient IDs and time stamps. the EDF Anonymizer has been approved for data sharing by the University of Wisconsin IRB.

All research products are available for download at `https://engineering.jhu.edu/nsa/`.

Ongoing Research Support

NIH R01HD108790 PI: Venkataraman 08/01/22 – 07/31/27
A Modular Framework for Data-Driven Neurogenetics to Predict Complex and Multidimensional Autistic Phenotypes
This project will develop novel computational algorithms that fuse multimodal neuroimaging and genetics data to bridge the multiple viewpoints of autism spectrum disorder (ASD). Our algorithms will be used to explore key questions related to the clinical heterogeneity of ASD and will be released as an open-source tool for the research community.
Agency: National Institute of Child Health and Human Development
Total Funding Amount: $2,393,218 over 5 years

JHU Catalyst Award PI: Venkataraman 05/01/22 – 04/30/23
A Biologically Inspired Deep Learning Framework to Bridge the Neurological, Biological, and Clinical Viewpoints of a Neuropsychiatric Disorder
*This project develops new deep learning models to uncover biomarkers related to substance abuse, major depression, and early-onset dementia using UK Biobank. This is a highly competitive internal award with a **25% funding rate.***
Total Funding Amount: $75,000 over 1 year

NIH R21CA263804 PI: Venkataraman 09/01/21 – 8/31/23
Automated Presurgical Language Mapping via Deep Learning for Multimodal Brain Connectivity
This project will develop a graph neural network to map the language areas of the brain using resting-state fMRI and diffusion MRI. We will link our predictions to change in postoperative cognitive functioning.
Agency: National Cancer Institute
Total Funding Amount: $405,949 over 2 years

NIH R01EB029977 PI: Caffo 08/01/21 – 07/31/25
Statistical Methods for Structural and Functional Integration in Multi-Modal Neuroimaging Data
This project will develop a suite of analytical tools to integrate structural and functional information about the brain to better understand and predict neurological dysfunction.
Agency: National Institute of Biomedical Imaging and Bioengineering
Project Role: Co-Investigator
Total Funding Amount: $1,939,749 over 4 years
Portion to Co-I Venkataraman: $590,000 over 4 years

JHU Discovery Award Joint PI: Faigle/Venkataraman 05/01/21 – 04/30/22
Harnessing Machine Learning to Optimize Stroke Critical Care Resource Use
*This project will develop an automated platform to continuously predict the risk of critical care needs for post-MT stroke patients. This is a highly competitive internal award with only a **15% funding rate.***
Total Funding Amount: $100,000 for 1 year

JHU Discovery Award Joint PI: Marvel/Venkataraman/Rosenthal 05/01/21 – 04/30/22
Using Motor Imagery and Machine Learning-Based Real-Time fMRI Neurofeedback to Improve Motor Function in Cerebellar Ataxia
*This project will use a real-time fMRI neurofeedback to train cerebellar ataxia patients to "exercise" their motor network. This is a highly competitive internal award with only a **15% funding rate.***
Total Funding Amount: $100,000 over 2 years

MCEH Seed Grant PI: Venkataraman 01/01/20 – 12/31/22
A Deep Learning Approach to Continuously Forecast Postop Kidney Failure During Cardiac Surgery
*This project develops an automated platform to predict the risk for AKI based on patient history and real-time intraoperative and physiological data. This is a competitive internal award with only a **20% funding rate.***
Total Funding Amount: $50,000 for 2 years

NSF CAREER 1845430 PI: Venkataraman 02/15/19 – 01/31/24
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: $500,006 over 5 years

Completed Research Support

NSF CRCNS 1822575 PI: Venkataraman 10/01/18 – 09/30/22
Discovering Network Structure in the Space of Group-Level Functional Differences
This project develops 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

GI Core Pilot Grant Program PI: Venkataraman 04/01/21 – 03/31/22
AI for Neuro-GI: Developing an AI-Driven Software to Construct and Analyze the First Large-Scale Network Map of the Enteric Nervous System
This project will develop AI methods to estimate the ENS connectome from immunostained microscopy and extract predictive topological measures of the network to compare across healthy and diseased cohorts.
Total Funding Amount: $15,000 for 1 year

JHU Discovery Award Joint PI: Venkataraman/Johnson/Sair/Jouny 07/01/19 – 06/30/21
Noninvasive Seizure Localization in Epilepsy Patients via Multimodal Magnetic Resonance Imaging
This project collects multimodal MRI from epilepsy patients and uses this data to develop new machine learning algorithms to localize the seizure onset. This is a highly competitive internal award with only a ***15% funding rate.***
Total Funding Amount: $100,000 over 2 years

JHMI Synergy Award Joint PI: Johnson/Venkataraman 07/01/17 – 06/31/19
Epileptic Seizure Localization via Bayesian Structure Learning
This project develops a Bayesian structure learning framework to track the origin and progression of a focal epileptic seizure in the brain. This is a highly competitive internal award with only a ***15% funding rate.***
Total Funding Amount: $100,000 over 2 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
This project 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

Public Mentions

Johns Hopkins Hub (October 2021): *A New Approach for Mapping the Brain Could Make Surgeries Safer*
Article Summary: Naresh Nandakumar is developing a painless, non-invasive approach using functional magnetic resonance imaging, or fMRI, to locate the eloquent cortex. (*Correspondent: Wick Eisenberg*)

Johns Hopkins Hub (March 2021): *Unlocking Schizophrenia's Secrets*
Article Summary: Engineering doctoral student Sayan Ghosal in the NSA Lab combines genetic and imaging data to develop better model of the mental illness. (*Correspondent: Wick Eisenberg*)

This Week in Machine Learning (TWiML) Podcast (October 2019): *Using AI to Diagnose and Treat Neurological Disorders with Archana Venkataraman*
Interview Summary: This conversation explores Archana Venkataraman's work in applying machine learning to these problems, including biomarker discovery, disorder severity prediction, along with some of the various techniques and frameworks used. (*Host: Sam Charrington*)

Center for Data Innovation (September 2019): *5 Q's for Archana Venkataraman*
Article Summary: The Center for Data Innovation spoke with Archana Venkataraman, assistant professor

of electrical and computer engineering at Johns Hopkins University. Venkataraman discussed how machine learning can help increase our understanding of complex neurological disorders. (*Correspondent: Joshua New*)

Fair Observer (August 2019): *South Asians Are Shaping the Future of Science and Technology*
Article Summary: Archana Venkataraman is using artificial intelligence (AI) to better map the human brain and to develop entirely new ways to diagnose and treat neurological disorders. (*Correspondent: Vikram Zutshi*)

MIT Technology Review (June/July 2019): *35 Innovators Under 35*
Article Summary: Archana Venkataraman develops mathematical models designed to unlock the "black box" of the brain's function and provide the building blocks for treatments. (*Correspondent: Jonathan Rosen*)

JHU Engineering Magazine (Summer 2019): *Safety First: Building a Resilient Future*
Article Summary: Researchers at Johns Hopkins develop algorithms to use brain imaging and electrical monitoring technology to localize epileptic foci in the brain. (*Correspondent: Andrew Meyers*)

JHU Engineering Magazine (Summer 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

Keynote Lectures

2021 **Unlocking the Translational Potential of Resting-State Data**
Medical Imaging Meets NeurIPS (MED-NEURIPS) Workshop
Invitation by Prof. Qi Dou

2017 **An Adaptive Framework to Extract Abnormal Brain Networks**
IEEE Joint Chapters Meeting, Rochester NY, USA
Invitation by Prof. Cristian A. Linte

Invited Talks and Seminars

2022 **Title: Deep-Generative Hybrid Learning as a New Window into Brain Dysfunction**
- ECE Seminar Series, University of Delaware, USA *(Host: Prof. Austin Brockmeier)*
- ECE Seminar Series, Princeton University, USA *(Host: Prof. Yasaman Ghasempour)*
- EECS Seminar Series, University of Michigan Ann Arbor, USA *(Host: Prof. Jeff Fessler)*

2022 **Title: Biologically Inspired Deep Learning as a New Window into Brain Dysfunction**
- ECE Seminar Series, Boston University, USA *(Host: Prof. Bobak Nazar)*
- CS Seminar Series, Vanderbilt University, USA *(Host: Prof. Benoit Dawant)*
- BioE Seminar Series, UIUC, USA *(Hosts: Profs. Brad Sutton and Mark Anastasio)*

2022 **Title: Bridging the Gap Between AI and Clin Neurosci via Deep-Generative Fusion Models**
- Guest Lecture, Google Brain, USA *(Host: Dr. Greg Bronevetsky)*

2021 **Title: Bridging the Gap Between AI and Clin Neurosci via Deep-Generative Fusion Models**
- Guest Lecture, Department of Electrical and Computer Engineering University of Southern California, USA *(Hosts: Profs. Richard Leahy and Shri Narayanan)*
- CMS Seminar Series, Department of Computer Science, CalTech, USA *(Host: Prof. Katie Bouman)*
- CISE Seminar Series, Boston University, USA *(Host: Prof. Vivek Goyal)*

2021 **Title: Bridging the Gap Between AI and Clin Neurosci via Deep-Generative Fusion Models**

- CSML Seminar Series, Department of Electrical and Computer Engineering, Princeton University, USA *(Hosts: Profs. Peter Ramadge and Kaushik Sengupta)*

2021 **Title: Deep Imaging-Genetics to Parse Neuropsychiatric Disorders**

- Machine Learning in Medicine Virtual Seminar, University of Pittsburgh & Carnegie Mellon University, USA *(Host: Prof. Kayhan Batmangelich)*
- BGIR Seminar Series, Erasmus MC, Netherlands *(Hosts: Prof. Wiro Niessen)*
- NIIN Seminar Series, Stevens Neuroimaging and Informatics Institute, Univ of Southern California, USA *(Hosts: Profs. Paul Thompson and Lauren Salminen)*
- ML in Medicine Seminar, Cornell University, USA *(Hosts: Profs. Mert Sabuncu and Amy Kuceyeski)*
- AI Center Summer Seminar Series, UIUC, USA *(Host: Prof. Ravishankar K. Iyer)*

2021 **Title: Unlocking the Translational Potential of Resting-State Data**

- VISE Seminar Series, Vanderbilt University, USA *(Hosts: Profs. Michael Miga and Benoit Dawant)*

2021 **Title: Deep Learning for Brain Connectivity: From Network Discovery to Clinical Translation**

- Brain Mapping Center Seminar Series, University of California Los Angeles, USA *(Hosts: Profs. David Shattuck and Shantanu Joshi)*

2021 **Title: You Can Teach an Old Dog New Tricks – Deep Learning in Data-Starved Regimes**

- Biomathematics Colloquium Talk, Department of Applied Mathematics, Florida State University, USA *(Hosts: Profs. Tom Needham and Ibrahim Ekren)*

2021 **Title: You Can Teach an Old Dog New Tricks – Deep Learning in Data-Starved Regimes**

- BMIC Seminar Series, ETH Zurich, Switzerland *(Hosts: Profs. Neerav Karani and Ender Konukoglu)*

2021 **Title: Deep Learning for Multimodal and Dynamic Functional Neuroimaging**

- School of Computing Colloquium, University of Leeds, United Kingdom *(Hosts: Prof. Alex Frangi)*
- Graduate Seminar Series, Department of Electrical Engineering Rochester Institute of Technology, USA *(Host: Prof. Jayanti Venkataraman)*

2020 **Title: You Can Teach an Old Dog New Tricks – Deep Learning in Data-Starved Regimes**

- Stanford Vision and Learning Lab, Stanford University, USA *(Host: Prof. Ehsan Adeli)*
- Departmental Colloquium, Department of Applied Mathematics, University of Pennsylvania, USA *(Hosts: Prof. Paris Perdikaris and Prof. James Gee)*

2020 **Title: Deep Learning for Multimodal and Dynamic Functional Neuroimaging**

- Feindel Virtual Brain and Mind Lecture, Montreal Neurological Institute, McGill University, Canada *(Hosts: Prof. Louis Collins and Prof. Tal Arbel)*

2019 **Title: Generative-Deep Hybrid Models to Decipher Brain Functionality**

- Guest Lecture, Athinoula A. Martinos Center for Biomedical Imaging, Mass General Hospital and Harvard Medical School, USA *(Hosts: Prof. Bruce Fischl, Prof. Lilla Zollei)*
- Guest Lecture, Medical Vision Group, Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology, USA *(Host: Prof. Polina Golland)*
- Special Departmental Seminar, Department of Electrical and Computer Engineering, University of Maryland College Park, USA *(Host: Prof. Behtash Babadi)*
- Departmental Seminar Series, Department of Biostatistics, University of Wisconsin Madison, USA *(Host: Prof. Vikas Singh)*

2019 **Title: Generative Models to Decode the Brain**

- Machine Leaning in Medicine Seminar Series, Department of Electrical and Computer Engineering, Cornell University, USA *(Hosts: Profs. Mert Sabuncu and Amy Kuceyeski)*
- Medical Imaging Seminar Series, Department of Computer Science, University of North Carolina Chapel Hill, USA *(Host: Prof. Martin Styner)*
- Neuroscience and Behavior Distinguished Seminar Series, Department of Neuroscience, University of Massachusetts Amherst, USA *(Host: Prof. Xian Du)*

2018 **Title: Mathematical Models for Functional Neuroimaging**

- Bodian Distinguished Lecture Series, Mind Brain Institute, Johns Hopkins University, USA *(Invitation by Prof. Ernst Niebur)*

2018 **Title: Generative Models to Decode Brain Pathology**

- Departmental Seminar Series, Department of Applied Mathematics and Statistics, Johns Hopkins University, USA *(Invitation by Prof. Tamas Budavari)*

2018 **Title: Automated Detection and Localization of Epileptic Seizures**

- Guest Lecture, Department of Anesthesiology and Critical Care Medicine, Johns Hopkins Medical Institute, USA *(Invitation by Prof. Robert Stevens)*

2017 **Title: An Adaptable Framework to Extract Abnormal Brain Networks**

- Distinguished Lecture Series, Institute for Computational Medicine, Johns Hopkins University, USA *(Invitation by Prof. Michael Miller)*
- Guest Lecture, Department of Biomedical Engineering, University of Rochester, USA *(Invitation by Prof. Cristian Linte)*
- Guest Lecture, Department of Electrical Engineering, Rochester Institute of Technology, USA *(Host: Prof. Jayanti Venkataraman)*
- Departmental Seminar Series, Department of Electrical and Computer Engineering, University of Virginia Charlottesville, USA *(Host: Prof. Daniel Weller)*

2016 **Title: An Adaptable Framework to Extract Abnormal Brain Networks**

- Departmental Seminar Series, Magnetic Resonance Research Center, Department of Radiology and Biomedical Imaging, Yale University, USA *(Invitation by Prof. Todd Constable)*
- Special Departmental Seminar, Department of Electrical and Computer Engineering, University of Texas San Antonio, USA *(Host: Prof. Yufei Huang)*
- Special Departmental Seminar, Department of Biomedical Engineering, Vanderbilt University, USA *(Host: Prof. Todd Giogio)*
- Special Departmental Seminar, Department of Electrical Engineering, University of Rochester, USA *(Host: Prof. Wendi Heinzelman)*
- Special Departmental Seminar, Department of Electrical Engineering and Systems Science, Washington University, USA *(Host: Prof. Arye Nehorai)*

2015 **Title: An Unbiased Bayesian Approach to Functional Connectomics Implicates Social-Communication Networks in Autism**

- Invited Session on Brain Connectivity, International Symposium on Biomedical Imaging, Brooklyn NY, USA *(Session Organizer: Prof. Vince Calhoun)*

Title: An Adaptable Framework to Extract Abnormal Brain Networks

- Special Departmental Seminar, Department of Electrical and Computer Engineering, Johns Hopkins University, USA *(Host: Prof. Jerry Prince)*

2014 **Title: Characterizing Abnormal Brain Networks**

- Invited Session on Neuroimaging, Image Processing Conference at SPIE Medical Imaging, San Diego CA, USA *(Session Organizer: Prof. Martin Styner)*

2013 **Title: Characterizing Abnormal Brain Networks**

- Special Departmental Seminar, Institute of Medical Engineering and Science, Massachusetts Institute of Technology, USA *(Host: Prof. Arup Chakraborty)*
- Special Departmental Seminar, Department of Electrical and Computer Engineering, Johns Hopkins University, USA *(Host: Prof. Jerry Prince)*
- Special Departmental Seminar, Department of Electrical and Computer Engineering, University of Texas Austin, USA *(Host: Prof. Constantine Caramanis)*
- Guest Lecture, Image Processing and Analysis Group, Department of Diagnostic Radiology, Yale University, USA *(Host: Prof. James Duncan)*

2012 **Title: From Brain Connectivity Models to Identifying Foci of a Neurological Disorder**

- Guest Lecture, Laboratory for Mathematical Imaging, Brigham and Womens Hospital, USA *(Invited by Prof. Carl-Fredrick Westin)*
- Rising Stars Workshop, Massachusetts Institute of Technology, USA *(Invited by Prof. Polina Golland)*

2012 **Title: Generative Models of Brain Connectivity for Population Studies**

- Guest Lecture, MIT Lincoln Laboratory, Lexington MA, USA *(Invited by Group 104)*
- Guest Lecture, MGH Martinos Center for Biomedical Imaging, USA *(Invited by Prof. Bruce Rosen)*

2011 **Title: Joint Modeling of Anatomical and Functional Connectivity for Population Studies**

- Guest Lecture, Parietal Team, Neurospin, Gif-sur-Yvette, France *(Hosts: Bertrand Thirion, Gael Varaquoaux)*

Conference, Workshop & Symposium Oral Presentations

2022 **Foundations of Bayesian Learning (Invited Lecture)**
ABCD-ReproNim: An ABCD Course on Reproducible Data Analyses (Virtual)

2021 **Bayesian Approaches in ML (Invited Lecture)**
ISMRM Course in Machine Learning: Everything You Wanted to Know But Were Afraid to Ask (Virtual)

2021 **Integrating Structural and Dynamic Functional Connectivity for Multidimensional Clinical Characterizations (Invited Talk)**
Big Data Neuroscience Workshop by the Advanced Computational Neuroscience Network, UIUC (Virtual)

2021 **How to Review (Invited Talk)**
MICCAI Tutorial on Publishing, Grant Writing, and Career Development (Virtual)

2021 **Integrating Convolutional Neural Networks and Probabilistic Graphical Models for Epileptic Seizure Detection and Localization (Invited Talk)**
ICML Workshop on Interpretable Machine Learning in Healthcare (Virtual)

2021 **Integrating Convolutional Neural Networks and Probabilistic Graphical Models for Epileptic Seizure Detection and Localization (Invited Talk)**
SIAM CSE Symposium on Data-Driven Methods for Biology and Medicine (Virtual)

2021 **M-GCN: A Multimodal Graph Convolutional Network to Integrate Functional and Structural Connectomics Data to Predict Multidimensional Phenotypic Characterizations**
Medical Imaging with Deep Learning Conference, Lübeck, Germany (Virtual)
Speaker: Niharika Shimona D'Souza, PhD Student

2021 **G-MIND: An End-to-End Multimodal Imaging-Genetics Framework for Biomarker Identification and Disease Classification**
SPIE Medical Imaging, Image Processing Conference, San Diego, CA (Virtual)
Speaker: Sayan Ghosal, PhD Student

2020 **Integrating Convolutional Neural Networks and Probabilistic Graphical Models for Epileptic Seizure Detection and Localization (Invited Talk)**

AI for Mental Disorders Workshop on WCCI (Virtual)

2020 **A Multi-Task Deep Learning Framework to Localize the Eloquent Cortex in Brain Tumor Patients using Both Static and Dynamic Functional Connectivity**
CNI: MICCAI Workshop on ML for Clinical Neuroimaging, Lima, Peru (Virtual)
Speaker: Naresh Nandakumar, PhD Student

2019 **Engineering Solutions to Brain Dysfunction**
EmTech, Massachusetts Institute of Technology

2019 **A Generative-Deep Hybrid Model for Epileptic Seizure Localization**
Mathematical Institute for Data Science Symposium, JHU

2019 **A Joint Network Optimization Framework to Predict Clinical Severity from Resting-State Functional MRI Data**
Second International Conference on Medical Imaging and Case Reports
Speaker: Niharika Shimona D'Souza, PhD Student

2019 **A Novel Graph Neural Network to Localize Eloquent Cortex in Brain Tumor Patients from Resting-State fMRI Connectivity**
CNI: MICCAI Workshop on Connectomics in Neuroimaging, ShenZhen, China
Speaker: Naresh Nandakumar, PhD Student

2019 **AI in Medicine: Opportunities and Hurdles**
JHU/APL Future of Humans and Machines Symposium

2019 **Integrating Convolutional Neural Networks and Probabilistic Graphical Modeling for Epileptic Seizure Detection in Multichannel EEG**
IPMI: International Conference on Information Processing in Medical Imaging, Hong Kong
Speaker: Jeff Craley, PhD Student

2019 **Predicting Behavior from Resting-State fMRI Connectivity**
SAND9: Statistical Analysis of Neuronal Data, Pittsburgh, PA

2018 **Defining Patient Specific Functional Parcellations in Lesional Cohorts via MRFs**
CNI: MICCAI Workshop on Connectomics in Neuroimaging, Granada, Spain
Speaker: Naresh Nandakumar, PhD Student

2017 **Extracting Network-Based Functional Differences from a Heterogeneous Patient Cohort**
CNI: MICCAI Workshop on Connectomics in Neuroimaging

2016 **Abnormal Functional Communities in Autism**
IMFAR: International Meeting for Autism Research

2015 **Community Detection in the Space of Functional Abnormalities Reveals Abnormal Brain Synchrony in Autism**
BAMBI: MICCAI Workshop on Bayesian and grAphical Models for Biomedical Imaging

2013 **Detecting Epileptic Regions Based on Global Brain Connectivity Patterns**
MICCAI: International Conference on Medical Image Computing and Computer Assisted Intervention

2012 **From Brain Connectivity Models to Identifying Foci of a Neurological Disorder**
MICCAI: International Conference on Medical Image Computing and Computer Assisted Intervention

2010 **Joint Generative Model for fMRI/DWI and it Application to Population Studies**
MICCAI: International Conference on Medical Image Computing and Computer Assisted Intervention

Other Poster Presentations

2020 **Bridging Imaging, Genetics, and Diagnosis in a Coupled Low-Dimensional Framework**
WSE/DOM Research Retreat, Johns Hopkins University

Presenter: Sayan Ghosal, PhD Student

2020 **A Novel Graph Neural Network to Localize Eloquent Cortex in Brain Tumor Patients from Resting-State fMRI Connectivity**
WSE/DOM Research Retreat, Johns Hopkins University
Presenter: Naresh Nandakumar, PhD Student

2020 **Automated Emotion Morphing in Speech Based on Diffeomorphic Curve Registration and Highway Networks**
WSE/DOM Research Retreat, Johns Hopkins University
Presenter: Ravi Shankar, PhD Student

2020 **Integrating Neural Networks and Dictionary Learning for Multidimensional Clinical Characterizations from Functional Connectomics Data**
WSE/DOM Research Retreat, Johns Hopkins University
Presenter: Niharika Shimona D'Souza, PhD Student

2020 **Automated Noninvasive Seizure Detection and Localization Using Switching Markov Models and Convolutional Neural Networks**
WSE/DOM Research Retreat, Johns Hopkins University
Presenter: Jeff Craley, PhD Student

2019 **A Generative-Predictive Framework to Capture Altered Brain Activity in fMRI and its Association with Genetic Risk: Application to Schizophrenia**
WSE/DOM Research Retreat, Johns Hopkins University
Presenter: Sayan Ghosal, PhD Student

2019 **Defining Patient Specific Functional Parcellations in Lesional Cohorts via MRFs**
WSE/DOM Research Retreat, Johns Hopkins University
Presenter: Naresh Nandakumar, PhD Student

2019 **A Generative-Discriminative Basis Learning Framework to Predict Clinical Severity from Resting State Functional MRI Data**
WSE/DOM Research Retreat, Johns Hopkins University
Presenter: Niharika Shimona D'Souza, PhD Student

2019 **A Novel Method for Epileptic Seizure Detection Using Coupled Hidden Markov Models**
WSE/DOM Research Retreat, Johns Hopkins University
Presenter: Jeff Craley, PhD Student

2015 **Bayesian Community Detection in the Space of Group-Level Functional Differences**
Yale Bioimaging Sciences Retreat Symposium

2012 **From Brain Connectivity Models to Identifying Foci of a Neurological Disorder**
Third Biennial Conference on Resting State Brain Connectivity

2009 **Exploring Functional Connectivity in fMRI via Clustering**
Annual Meeting of the Organization of Human Brain Mapping

2005 **An Integrated Low-Power Switched-Capacitor DC-DC Power Converter**
Interconnect Focus Center Design Review, Atlanta, GA

Teaching Initiatives

Courses Taught at Johns Hopkins University

EN.520.746 *Seminar in Medical Image Analysis*
This graduate seminar explores key topics in the field, such as functional MRI analysis, object tracking, uncertainty quantification, deformable registration, and image segmentation.

Semesters Taught: Spring 2021

EN.520.651 *Random Signals Analysis*
A core graduate course that covers the fundamentals of 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
Semesters Taught: Fall 2016, Fall 2017, Fall 2018, Fall 2019, Fall 2020, Fall 2021, Fall 2022

EN.520.385 *Signals, Systems and Learning*
An elective undergraduate course that covers detection and estimation in signal processing.
Selected Topics: Discrete time Fourier transforms, Z-transforms, probability spaces, random variables, derived distributions, random processes, power spectral density, signal estimation, hypothesis testing, signal detection, state-space models, clustering algorithms
Semesters Taught: Spring 2018, Spring 2019, Spring 2020

Teaching Prior to Professorship (MIT)

6.437 *Information and Inference*
Teaching assistant for a core graduate course in machine learning.
Responsibilities: teaching weekly recitation, writing and grading exams, compiling homework assignments and solutions, holding weekly office hours
Semester Taught: Spring 2011

HKN SP *Introduction to Signals and Systems*
Developed an introductory signals and systems course to prep underclassmen; compiled and taught four (chalkboard) lectures, each one lasting three hours
Taught: Intersession 2006

Mentoring Activities

PhD Students

1. Arunkumar Kannan — Sept 2022 – Present
   Department: Electrical and Computer Engineering
   Project: Predictive Multimodal and Dynamic Connectomics
2. Deeksha Shama — Sept 2021 – Present
   Department: Electrical and Computer Engineering
   Project: Detecting and Localizing Epileptic Seizures
3. Natalie Aw — Aug 2021 – Present
   Department: Electrical and Computer Engineering
   Project: Multimodal Brain Connectivity Analysis
4. Sayan Ghosal — Sept 2017 – May 2023 (Exp)
   Department: Electrical and Computer Engineering
   Project: Imaging-Genetics for Schizophrenia
5. Ravi Shankar — Sept 2017 – May 2023 (Exp)
   Department: Electrical and Computer Engineering
   Project: Manipulating Emotional Content in Speech
6. Naresh Nandakumar — June 2017 – May 2023 (Exp)
   Department: Electrical and Computer Engineering
   Project: Localizing Eloquent Cortex for Presurgical Planning

7. Jeff Craley June 2017 – Dec 2021
   Department: Electrical and Computer Engineering
   Thesis Title: Novel Graphical Model and Neural Network Frameworks for Automated Seizure Detection, Tracking, and Localization in Focal Epilepsy
   First Postgraduate Position: Data Scientist at Nference

8. Niharika Shimona D'Souza Sept 2016 – Nov 2021
   Department: Electrical and Computer Engineering
   Thesis Title: Blending Generative Models with Deep Learning for Multidimensional Phenotypic Prediction from Brain Connectivity Data
   First Postgraduate Position: Research Scientist at IBM Corporate Research

Rotation PhD Students

1. Pouria Tohidi April 2017 – Mar 2018
   Department: Electrical and Computer Engineering
   Project: Epileptic Seizure Detection

2. Jacob Reinhold Aug 2017 – Jan 2018
   Department: Electrical and Computer Engineering
   Project: Manipulating Emotional Content in Speech

Masters Students

1. Eun Tack Cho Sept 2022 – Present
   Department: Computer Science
   Graduate Project: Neurocognitive Functioning in Brain Tumor Patients

2. Abdouh Harouna Harouna Kenfack Sept 2022 – Present
   Department: Applied Mathematics & Statistics
   Graduate Project: Deep Learning Models for Emotional Speech Recognition

3. Evan Yu Nov 2019 – May 2021
   Department: Biomedical Engineering
   Graduate Project: Predicting Acute Kidney Injury from Intraoperative Measurements
   Co-advised with Charles Brown in the Department of Anesthesiology
   First Postgraduate Position: PhD Student at University of Texas, Dallas

4. Yi-Te Hsu March 2020 – Dec 2020
   Department: Computer Science
   Graduate Project: Sequence-to-Sequence Models for Emotion Conversion in Speech
   First Postgraduate Position: Machine Learning Engineer at Otter.ai

5. Rohan Nandkarni Jan 2018 – June 2019
   Department: Biomedical Engineering
   Thesis Title: Examination of the Association Between Arterial Blood Pressure Below the Lower Limit of Autoregulation and Acute Kidney Injury After Cardiac Surgery
   Co-advised with Charles Brown in the Department of Anesthesiology
   First Postgraduate Position: Researcher in the Imaging for Surgery, Therapy and Radiology Lab

Undergraduate Students

1. Sarah Wu Sept 2021 – Present
   Department: Electrical & Computer Engineering
   Project: Imaging-Genetics for Neuropsychiatric Disorders

2. Jiasen Jing Sept 2021 – Present
   Department: Computer Science
   Project: Mapping the Enteric Nervous System

3. Arjun Somayazulu — Oct 2019 – May 2022
   Department: Computer Science and Biomedical Engineering
   Project: Emotion Recognition from Human Speech

4. Yu-Chung Peng — Sept 2019 – May 2022
   Department: Computer Science and Neuroscience
   Project: Machine Learning Algorithms to Predict Postoperative AKI

5. Narayani Wagle — Jan 2019 – May 2022
   Department: Computer Science and Biomedical Engineering
   Project: Analyzing the Structure and Function of the Enteric Nervous System

6. Yuta Kobayashi — Jan 2019 – May 2022
   Department: Biomedical Engineering
   Project: Analyzing the Structure and Function of the Enteric Nervous System

7. Liliveth Nwanguma — Sept 2021 – Jan 2022
   Department: Cognitive Science
   Project: Eloquent Cortex Localization

8. Karina Soto Perez — June 2021 – Aug 2021
   Department: NSF Research Experiences for Undergraduates Program
   Project: Predicting ASD and ADHD
   First Post-Departure Position: Undergraduate Student at HCC

9. Allie Burgess — June 2021 – Aug 2021
   Department: NSF Research Experiences for Undergraduates Program
   Project: Predicting ASD and ADHD
   First Post-Departure Position: Undergraduate Student at the University of Alabama

10. Danielle Currey — Nov 2019 – May 2021
    Department: Computer Science
    Project: Epileptic Seizure Detection
    First Post-Departure Position: Research Assistant, Beth Israel Deaconess Medical Center

11. Kavi Wick — June 2020 – Aug 2020
    Department: NSF Research Experiences for Undergraduates Program
    Project: Predicting Spinal Cord Injury
    First Post-Departure Position: Undergraduate Student at Rutgers University

12. Yesika Alexandra Agudelo Londono — Jan 2020 – July 2020
    Home Institution: Universidad De Antioquia, Colombia
    Project: Predicting Neurological Disorders from rs-fMRI Data
    Visiting Student sponsored by the Colciencias
    First Post-Departure Position: Research Assistant in Colombia

13. Jacob Sager — June 2017 – June 2019
    Department: Electrical and Computer Engineering
    Project: Emotion Recognition from Human Speech
    First Postgraduate Position: Software Engineer at FiscalNote

14. Duha Awad — June 2018 – Aug 2018
    Department: NSF Research Experiences for Undergraduates Program
    Project: Epileptic Seizure Detection
    First Post-Departure Position: Undergraduate Student at University of Maryland, College Park

University Service

Department of Electrical and Computer Engineering

ECE Curriculum Committee	2018 – Present
Graduate Student Admissions	2017 – Present
Distinguished Lecturer Committee	2016 – 2022
Co-Director, Conference on Information Sciences and Systems (CISS)	2020 – 2021
ECE Department Head Search Committee	2020 – 2021
ECE Department Chair Election Committee	2020
ECE Faculty Search Committee	2018 – 2019
ECE Department Chair Election Committee	2017
Graduate Student Visit Day Organizer	2017

Whiting School of Engineering

AI-X Initiative Steering Committee	2019 – Present
MINDS Symposium Planning Committee	2019
WSE/DOM Research Retreat Committee	2018 – 2020
MINDS Faculty Search Committee	2018 – 2019
Malone Center Mix & Mingle Organizer	2016 – 2018
WSE Curriculum Committee	2016 – 2018
Malone Center Student Symposium Organizer	2017
ChemBE Dept Head Search Committee	2017 – 2018
Malone Center Faculty Search Committee	2016 – 2017

Doctoral Thesis Committee Membership (Non Advisees)

1. Ranjani Srinivasan — Dec 2022 (Exp)
   Department: Electrical and Computer Engineering
   Thesis Advisor: Ilya Shpitser, CS
2. Muhan Shao — August 2022
   Department: Electrical and Computer Engineering
   Thesis Title: Multimodal MRI Analysis Using Deep Learning Methods
   Thesis Advisor: Jerry Prince, ECE
3. Juntang Zhuang — May 2022
   Department: Biomedical Engineering
   Institution: Yale University
   Thesis Title: Machine Learning Methods to Estimate Whole-brain Effective Connectome for ASD Identification
   Thesis Advisor: Jim Duncan, BME
4. Ben Strober — Nov 2021
   Department: Computer Science
   Thesis Title: Modeling the Impact of Genetic Variation on Gene Expression
   Thesis Advisor: Alexis Battle, BME
5. Yufan He — Aug 2021
   Department: Electrical and Computer Engineering
   Thesis Title: Retinal OCT Image Analysis Using Deep Learning
   Thesis Advisor: Jerry Prince, ECE
6. Jordi Abante — May 2021
   Department: Electrical and Computer Engineering
   Thesis Title: Statistical Signal Processing for Epigenetic Landscape Analysis
   Thesis Advisor: John Goutsias, ECE
7. Golnoosh Kamali — Oct 2020
   Department: Biomedical Engineering
   Thesis Title: Transfer Function Models of Cortico-Cortical Evoked Potentials for the Localization of Seizures in Medically Refractory Epilepsy Patients
   Thesis Advisor: Sridevi Sarma, BME

8. Yi (Gary) Li — August 2020
   Department: Electrical and Computer Engineering
   Thesis Title: Optimization of Administered Activity for Pediatric Renal SPECT Imaging
   Thesis Advisor: Eric Frey, Medicine

9. Evan Schwab — Nov 2017
   Department: Electrical and Computer Engineering
   Thesis Title: Joint Spatial-Angular Sparse Coding, Compressed Sensing, and Dictionary Learning for D-MRI
   Thesis Advisors: Rene Vidal, BME and Nicholas Charon, AMS

Masters Thesis Committee Membership (Non Advisees)

1. Carolina Pacheco — Aug 2018
   Department: Biomedical Engineering
   Thesis Title: Recurrent Neural Nets for Classification of Human Embryonic Stem Cell-Derived Cardiomyocytes
   Thesis Advisor: Rene Vidal, BME

Graduate Board Exams Administered

1. Hongbo Li — Dec 2022 (Exp)
   Department: Biomedical Engineering
2. Vivek Jani — Jan 2022
   Department: Biomedical Engineering
3. Ranjani Srinivasan — June 2021
   Department: Electrical and Computer Engineering
4. Ravi Shankar — May 2021
   Department: Electrical and Computer Engineering
5. Naresh Nandakumar — Oct 2020
   Department: Electrical and Computer Engineering
6. Sayan Ghosal — Oct 2020
   Department: Electrical and Computer Engineering
7. Blake Dewey — Sept 2019
   Department: Electrical and Computer Engineering
8. Miguel Vivar Lazo — June 2019
   Department: Biomedical Engineering
9. Yufan He — June 2019
   Department: Electrical and Computer Engineering
10. Niharika Shimona D'Souza — April 2019
    Department: Electrical and Computer Engineering
11. Jeff Craley — April 2019
    Department: Electrical and Computer Engineering
12. Jordi Abante Llenas — April 2019
    Department: Electrical and Computer Engineering
13. Muhan Shao — Feb 2019
    Department: Electrical and Computer Engineering
14. Scott Sterrett — Feb 2019
    Department: Biomedical Engineering
15. Wenying Wang — April 2018
    Department: Biomedical Engineering

ECE Qualifying Exams Administered

- Natalie Aw (Aug 2022)
- Agustin Castellano (Aug 2022)
- Deeksha Shama (Aug 2022)
- Liangzu Peng (Aug 2022)
- Mardava Gubbi (Aug 2019)
- Hancheng Min (Jan 2019)
- Naresh Nandakumar (Aug 2018)
- Ravi Shankar (Aug 2018)
- Sayan Ghosal (Aug 2018)
- Ranjani Srinivasan (Aug 2018)
- Jacob Reinhold (Aug 2018)
- Yan Jiang (Jan 2018)
- Niharika Shimona D'Souza (Aug 2017)
- Yufan He (Aug 2017)
- Muhan Shao (Aug 2017)
- Mengnan Zhao (Aug 2017)
- Nanxin Chen (Jan 2017)
- Jaejin Cho (Jan 2017)

Outreach Activities

MICCAI Academia & Industry Networking Panel	2022
Fulbright Scholars Interview Panel	2022
MICCAI Faculty Mentor (for Postdocs and Graduate Students)	2020 – 2021
Speaker, Introduction to Computing Research (ICR) Workshop	2021
STEM Achievement in Baltimore Elementary Schools (SABES) Virtual Summer Session	2020
Mentor for the Rising Stars in Biomedical Workshop	2018 – 2019
Judge and Volunteer for the Maryland State Science Olympiad	2017
Keynote Speaker, Graduate Association of Women in Computer Science and Electrical & Computer Engineering (GRACE) Mentoring Dinner	2016

Professional Society Memberships

Sigma Xi Honor Society	2020 – Present
International Speech and Communication Association (ISCA)	2019 – Present
American Epilepsy Society (AES)	2019 – Present
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

References

Available upon request.