CURRICULUM VITAE

Date of Revision: April 1, 2021

Name: Nicha C. Dvornek, Ph.D.

Proposed for Appointment to: -

Term: -

School: Yale University School of Medicine

Reason for Promotion: -

Education:

B.S.	Johns Hopkins University (Biomedical Engineering) 2006
M.S.	Yale University (Engineering & Applied Science) 2007
M.Phil.	Yale University (Engineering & Applied Science) 2009
Ph.D.	Yale University (Engineering & Applied Science) 2012

Career/Academic Appointments:

2012-2015	Postdoctoral Associate, Dept. of Radiology & Biomedical Imaging (formerly Diagnostic Radiology), Yale University School of Medicine, New Haven, CT
2015-2017	Postdoctoral Fellow, Child Study Center, Yale University School of Medicine, New Haven, CT
2017-2018	Associate Research Scientist, Dept. of Radiology & Biomedical Imaging, Yale University School of Medicine, New Haven, CT
2018-present	Assistant Professor, Dept. of Radiology & Biomedical Imaging, Yale University School of Medicine, New Haven, CT
2019-present	Assistant Professor, Dept. of Biomedical Engineering, Yale University, New Haven, CT (Secondary appointment)

Professional Honors & Recognition

International/National/Regional

2020: Best Paper Award, 2nd MICCAI Workshop on Domain Adaptation and Representation Transfer
2019: Best Challenger Award, Connectomics in Neuroimaging - Transfer Learning Challenge
2019: Best Paper Award, 10th International Workshop on Machine Learning in Medical Imaging
2017: IPMI Scholarship for Junior Scientists from Underrepresented Populations
2011: International Symposium on Biomedical Imaging 2011 NIH-funded Travel Award
2010: International Symposium on Biomedical Imaging 2010 Travel Award
2010: Yale University Graduate Student Association Conference Travel Fund Award
2007: Honorable Mention Poster Award, SPIE Medical Imaging
2006: Yale University Faculty of Engineering Fellowship
2006: Yale University - Pierre W. Hoge Fellowship
2006: Richard J. Johns Award (from Johns Hopkins University Department of Biomedical Engineering)
2006: Tau Beta Pi (Johns Hopkins University Chapter) Appreciation Award
2006: Johns Hopkins University Women's Club Scholarship
2005: Tau Beta Pi, Johns Hopkins University
2005: Alpha Eta Mu Beta, Johns Hopkins University

University

2013: Yale University School of Medicine Diagnostic Radiology Grand Rounds Poster Award

Grant/Clinical Trials History:

Current Grants

Agency: NIH/NINDS
I.D.# R01 NS035193
Title: "Subnetwork-based Quantitative Imaging Biomarkers for Therapy Assessment in Autism"
P.I.: James S. Duncan, Ph.D. / Lawrence H. Staib, Ph.D. / Kevin A. Pelphrey, Ph.D.
Role on Project: Investigator
Percent effort: 20%
Direct costs per year: $247,168
Total costs for project period: $1,876,785 (latest round of funding)
Project period: 09/01/2016 – 05/31/2021 (latest round of funding)

Agency: NIH/NCI
I.D.# R01 CA224140
Title: "Personalized Task-Based Respiratory Motion Correction for Low-Dose PET/CT"
P.I.: Chi Liu, Ph.D.
Role on Project: Investigator
Percent effort: 20%
Direct costs per year: $ 364,605
Total costs for project period: $1,832,698 (to date)
Project period: 07/02/2018 – 06/30/2023

Agency: NIH/NIBIB
I.D.# R01 EB025468
Title: "Quantitative Low-Dose PET Imaging"
P.I.: Chi Liu, Ph.D. / Richard Carson, Ph.D.
Role on Project: Investigator
Percent effort: 3%
Direct costs per year: $416,011
Total costs for project period: $2,488,796 (to date)
Project period: 07/24/2018 – 04/30/2022

Agency: NIH/NIBIB
I.D.# R21 EB026759
Title: "Non-invasive Estimation of the Arterial Input Function in PET Studies using Whole-Body Physiological Models"
P.I.: Jean-Dominique Gallezot, Ph.D.
Role on Project: Investigator
Percent effort: 0.75%
Direct costs per year: $150,000
Total costs for project period: $502,500 (to date)
Project period: 09/16/19-06/30/22

Past Grants

Agency: NIH/NICHD
I.D.# R01 MH100028
Title: "Multimodal Developmental Neurogenetics of Females with ASD"
P.I.: Kevin Pelphrey, Ph.D.; Subcontract - James S. Duncan, Ph.D. / Pamela Ventola, Ph.D.
Role on Project: Investigator
Percent effort: 52%
Total costs for project period: $23,156,768 (to date)
Project period: 09/04/2012 – 07/31/2022

Agency: NIH/NINDS

I.D.# R01 NS035193
Title: "Subnetwork-based Quantitative Imaging Biomarkers for Therapy Assessment in Autism"
P.I.: James S. Duncan, Ph.D.
Role on Project: Associate Research Scientist, 07/01/2017-06/30/2018
Percent effort: 100% ($60,000 per year)
Total costs for project period: $1,876,785 (latest round of funding)
Project period: 09/01/2016 – 05/31/2021 (latest round of funding)

Agency: NIH/NIMH
I.D.# T32 MH018268
Title: "Training Program in Childhood Neuropsychiatric Disorders"
P.I.: Michael J. Crowley, Ph.D.
Role on Project: Postdoctoral Fellow, 07/01/2015-06/30/2017
Percent effort: 100% ($51,120 per year)
Total costs for project period: $2.0M (round of funding during fellowship)
Project period: 07/01/2015 – 06/30/2020 (round of funding during fellowship)

Agency: Yale University School of Medicine
I.D.# James Hudson Brown – Alexander Brown Coxe Postdoctoral Fellowship
Title: "Fast Image Processing for Cryo-EM Structure Determination"
P.I.: Nicha C. Dvornek, Ph.D.
Percent effort: 100%
Total costs for project period: $42,000
Project period: 07/01/2014 – 06/30/2015

Agency: NIH/NLM
I.D.# R01 LM010142
Title: "Fast 3D Reconstruction Algorithms for Cryo-EM"
P.I.: Hemant D. Tagare, Ph.D.
Role on Project: Postdoctoral Associate, 09/01/2012-06/30/2014
Percent effort: 100% ($41,000 per year)
Total costs for project period: $1,569,824
Project period: 07/15/2010 – 07/14/2014

Pending Grants

Agency: Johnson & Johnson
I.D.# WiSTEM2D Scholars Award
Title: "Mammographic Biomarkers Predictive of Cancer in Dense Breasts"
P.I.: Nicha C. Dvornek, Ph.D.
Percent effort: 1%
Total costs for project period: $150,000
Project period: 05/01/2021 – 04/30/2024

Agency: NIH/NIBIB
I.D.# 1 R21 NS125029-01
Title: "Functional MRI Biomarkers for Developing Personalized Interventions in Parkinson's Disease"
P.I.: Nicha C. Dvornek, Ph.D.
Percent effort: 30%
Total costs for project period: $424,426
Project period: 09/01/2021 – 08/31/2023

Invited Speaking Engagements, Presentations, Symposia & Workshops Not Affiliated With Yale:

International/National

2016: Rising Stars in Biomedical, Massachusetts Institute of Technology, Cambridge, MA: "Predicting Autism Behavioral Treatment Response from Baseline Functional MRI."

Peer-Reviewed Presentations & Symposia Given at Meetings Not Affiliated With Yale:

International/National

2020: 11th International Workshop on Machine Learning in Medical Imaging, Virtual: "Demographic-Guided Attention in Recurrent Neural Networks for Modeling Neuropathophysiological Heterogeneity."
2020: 17th IEEE International Symposium on Biomedical Imaging: From Nano to Macro, Virtual: "Estimating Reproducible Functional Networks Associated with Task Dynamics Using Unsupervised LSTMs."
2018: 15th IEEE International Symposium on Biomedical Imaging: From Nano to Macro, Washington, D.C.: "Combining Phenotypic and Resting-State fMRI Data for Autism Classification with Recurrent Neural Networks."
2017: Eighth International Workshop on Machine Learning in Medical Imaging, Quebec City, Canada: "Identifying Autism from Resting-State fMRI Using Long Short-Term Memory Networks."
2016: Sixth International Workshop on Multimodal Learning for Clinical Decision Support, Athens, Greece: "Prediction of Autism Treatment Response from Baseline fMRI using Random Forests and Tree Bagging."
2014: National Resource for Automated Molecular Microscopy Workshop on Advanced Topics in EM Structure Determination, La Jolla, CA: "A Fast EM Algorithm for Single Particle Reconstruction."
2012: Second International Workshop on Spatiotemporal Image Analysis for Longitudinal and Time-Series Image Data, Nice, France: "Tracking Metastatic Brain Tumors in Longitudinal Scans via Joint Image Registration and Labeling."
2011: Biomedical Engineering Society Annual Meeting, Hartford, CT: "Robust Registration of Brain MRI with Missing Correspondences."
2011: 33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Boston, MA: "Non-rigid Registration of Longitudinal Brain Tumor Treatment MRI."
2011: 8th IEEE International Symposium on Biomedical Imaging: From Nano to Macro, Chicago, IL: "Registration of Brain Resection MRI with Intensity and Location Priors."
2010: 13th International Conference on Medical Image Computing and Computer Assisted Intervention, Beijing, China: "Non-rigid Registration with Missing Correspondences in Preoperative and Postresection Brain Images."
2010: 7th IEEE International Symposium on Biomedical Imaging: From Nano to Macro, Rotterdam, The Netherlands: "Pairwise Registration of Images With Missing Correspondences Due to Resection."
2005: Biomedical Engineering Society Annual Fall Meeting, Section on Highlights of Undergraduate Bioengineering Research, Baltimore, MD: "Design and Optimization of Gene Oscillatory Networks through Stochastic Simulations."

Professional Service

Journal Service:
Reviewer for *Frontiers in Neuroscience*, *Frontiers in Human Neuroscience*, *PLOS ONE, Medical Image Analysis, Frontiers in Computational Neuroscience, Journal of Magnetic Resonance Imaging, IEEE Transactions on Medical Imaging, Journal of Mathematical Imaging and Vision*

Professional Service for Professional Organizations:

Meeting Planning/Participation

2020-present Reviewer, International Conference on Medical Imaging with Deep Learning
2019 Program Committee Member, Medical Imaging meets NeurIPS (NeurIPS Workshop)
2018-2019 Area Chair, International Conference on Medical Imaging with Deep Learning
2013-present Reviewer, IEEE International Symposium on Biomedical Imaging: From Nano to

Macro
2011-present Reviewer, Medical Image Computing and Computer Assisted Intervention Conference

Yale University Service:

Departmental Committees
2020 Co-organizer, BME Open House for Prospective Ph.D. Students Planning Committee
2017-2018 Member, Planning Committee for Division of Bioimaging Sciences Retreat 2018

Bibliography:

Peer-Reviewed Original Research

1. **Chitphakdithai, N.** and Duncan, J.S., "Pairwise Registration of Images With Missing Correspondences Due to Resection," In: *2010 7th IEEE International Symposium on Biomedical Imaging: From Nano to Macro*, 2010, pp. 1025-1028.
2. **Chitphakdithai, N.** and Duncan, J.S., "Non-rigid Registration with Missing Correspondences in Preoperative and Postresection Brain Images," In: *MICCAI 2010*, *Part I*, 2010, LNCS vol. 6361, pp. 367-374.
3. **Chitphakdithai, N.**, Vives, K.P., and Duncan, J.S., "Registration of Brain Resection MRI with Intensity and Location Priors," In: *2011 8th IEEE International Symposium on Biomedical Imaging: From Nano to Macro*, 2011, pp. 1520-1523.
4. **Chitphakdithai, N.**, Chiang, V.L., and Duncan, J.S., "Non-rigid Registration of Longitudinal Brain Tumor Treatment MRI," In: *33rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 2011, pp. 4893-4896.
5. **Chitphakdithai, N.**, Chiang, V.L., and Duncan, J.S., "Tracking Metastatic Brain Tumors in Longitudinal Scans via Joint Image Registration and Labeling," In: *Spatiotemporal Image Analysis for Longitudinal and Time-Series Image Data*, 2012, LNCS vol. 7570, pp. 124-136.
6. **Dvornek, N.C.**, Sigworth, F.J., and Tagare, H.D., "SubspaceEM: A Fast Maximum-a-posteriori Algorithm for Cryo-EM Single Particle Reconstruction," *Journal of Structural Biology*, 2015, vol. 190, no. 2, pp. 200-214.
7. Venkataraman, A, Yang, D.Y.J., **Dvornek, N**, Staib, L.H., Duncan, J.S., Pelphrey, K.A., Ventola, P., "Pivotal response treatment prompts a functional rewiring of the brain among individuals with autism spectrum disorder," *Neuroreport*, 2016, vol. 27, no. 14, pp. 1081-1085.
8. **Dvornek, N.C**., Yang, D., Venkataraman, A., Ventola, P., Staib, L.H., Pelphrey, K.A., Duncan, J.S., "Prediction of Autism Treatment Response from Baseline fMRI using Random Forests and Tree Bagging," In: *Sixth International Workshop on Multimodal Learning for Clinical Decision Support*, 2016.
9. Yang, D., Pelphrey, K.A., Sukholdolsky, D., Crowley, M., Dayan, E., **Dvornek, N.C.**, Venkataraman, A., Duncan, J.S., Staib, L.H., Ventola, P., "Brain Responses to Biological Motion Predict Treatment Outcome in Young Children with Autism," *Translational Psychiatry*, 2016, vol. 6, no. 11, e948.
10. **Dvornek, N.C.**, Ventola, P., Pelphrey, K.A., Duncan, J.S., "Identifying Autism from Resting-State fMRI Using Long Short-Term Memory Networks," In: *8th International Workshop on Machine Learning in Medical Imaging*, 2017, LNCS vol. 10541, pp. 362-370.
11. **Dvornek, N.C.**, Ventola, P., Duncan, J.S., "Combining Phenotypic and Resting-State fMRI Data for Autism Classification with Recurrent Neural Networks," In: *IEEE International Symposium on Biomedical Imaging (ISBI)*, April 2018, pp. 725-528.
12. Li, X., **Dvornek, N.**, Papademetris, X., Zhuang, J., Staib, L.H., Ventola, P., Duncan, J., "2-Channel Convolutional 3D Deep Neural Network (2CC3D) for fMRI Analysis: ASD Classification and Feature Learning," In: *IEEE International Symposium on Biomedical Imaging (ISBI)*, April 2018, pp. 1252-1255.
13. Zhuang, J., **Dvornek, N.**, Li, X., Yang, D., Ventola, P., Duncan, J., "Prediction of pivotal response treatment outcome with task fMRI using random forest and variable selection," In: *IEEE International Symposium on Biomedical Imaging (ISBI)*, April 2018, pp. 97-100.
14. **Dvornek, N.C.**, Yang, D., Ventola, P., Duncan J.S., "Learning Generalizable Recurrent Neural Networks from Small Task-fMRI Datasets," In: *Medical Image Computing and Computer Assisted Intervention - MICCAI 2018*, 2018, LNCS 11072, pp. 329–337.

15. Li, X., **Dvornek, N.C.**, Zhuang, J., Ventola, P. and Duncan, J.S., "Brain biomarker interpretation in asd using deep learning and fmri," In: *Medical Image Computing and Computer-Assisted Intervention – MICCAI 2018*, 2018, LNCS 11072, pp. 206-214.
16. Zhuang, J., **Dvornek, N.C.**, Li, X., Ventola, P. and Duncan, J.S., "Prediction of Severity and Treatment Outcome for ASD from fMRI," In: *International Workshop on PRedictive Intelligence In MEdicine*, 2018, LNCS 11121, pp. 9-17.
17. Zhuang, J., **Dvornek, N.C.**, Zhao, Q., Li, X., Ventola, P. and Duncan, J.S., "Prediction of treatment outcome for autism from structure of the brain based on sure independence screening," In: *IEEE International Symposium on Biomedical Imaging (ISBI),* April 2019, pp. 404-408.
18. Li, X., **Dvornek, N.C.**, Zhou, Y., Zhuang, J., Ventola, P. and Duncan, J.S., "Efficient Interpretation of Deep Learning Models Using Graph Structure and Cooperative Game Theory: Application to ASD Biomarker Discovery," In: *Information Processing in Medical Imaging (IPMI 2019)*, LNCS 11492, June 2019, pp 718-730.
19. Zhuang, J., Yang, J., Gu, L., and **Dvornek, N.**, "ShelfNet for Fast Semantic Segmentation," In: *2019 IEEE/CVF International Conference on Computer Vision Workshop (ICCVW)*, 2019, pp. 847-856.
20. Yang, J., **Dvornek, N.C.**, Zhang, F., Zhuang, J., Chapiro, J., Lin, M., Duncan, J.S., "Domain-Agnostic Learning With Anatomy-Consistent Embedding for Cross-Modality Liver Segmentation," In: *2019 IEEE/CVF International Conference on Computer Vision Workshop (ICCVW)*, 2019, pp. 323-331.
21. Zhuang, J., **Dvornek, N.C.**, Li, X., Yang, J., and Duncan, J., "Decision explanation and feature importance for invertible networks," In: *2019 IEEE/CVF International Conference on Computer Vision Workshop (ICCVW)*, 2019, pp. 4235-4239.
22. Li, X., **Dvornek, N.C.**, Zhou, Y., Zhuang, J., Ventola, P., and Duncan, J.S., "Graph neural network for interpreting task-fmri biomarkers," In: *Medical Image Computing and Computer Assisted Intervention – MICCAI 2019*, 2019, LNCS 11768, pp. 485-493.
23. Zhuang, J., **Dvornek, N.C.**, Li, X., Ventola, P., Duncan, J.S., "Invertible Network for Classification and Biomarker Selection for ASD," In: *Medical Image Computing and Computer Assisted Intervention – MICCAI 2019*, 2019, LNCS 11766, pp. 700-708.
24. Yang, J., **Dvornek, N.C.**, Zhang, F., Chapiro, J., Lin, M., Duncan, J.S., "Unsupervised Domain Adaptation via Disentangled Representations: Application to Cross-Modality Liver Segmentation," In: *Medical Image Computing and Computer Assisted Intervention – MICCAI 2019*, 2019, LNCS 11765, pp. 255-263.
25. **Dvornek, N.C.**, Li, X., Zhuang, J., Duncan, J.S. "Jointly Discriminative and Generative Recurrent Neural Networks for Learning from fMRI," In: *Machine Learning in Medical Imaging (MLMI 2019)*, 2019, LNCS 11861, pp. 382-390.
26. Zhuang, J., **Dvornek, N.C.**, Li, X., Yang, J., Duncan, J., "Decision explanation and feature importance for invertible networks," In: *IEEE/CVF International Conference on Computer Vision Workshop (ICCVW)*, Oct. 2019, pp. 4235-4239.
27. **Dvornek, N.C.**, Ventola, P., Duncan, J.S., "Estimating Reproducible Functional Networks Associated with Task Dynamics Using Unsupervised LSTMs," In: *IEEE International Symposium on Biomedical Imaging (ISBI),* April 2020, pp. 1395-1398.
28. Zhang, F., **Dvornek, N.**, Yang, J., Chapiro, J., and Duncan, J., "Layer Embedding Analysis in Convolutional Neural Networks for Improved Probability Calibration and Classification," *IEEE Transactions on Medical Imaging,* 2020.
29. Zhuang, J., **Dvornek, N.**, Li, X., Tatikonda, S., Papademetris, X., Duncan, J., "Adaptive Checkpoint Adjoint Method for Gradient Estimation in Neural ODE," In: *International Conference on Machine Learning (ICML 2020)*, 2020, PMLR 119, pp. 11639-11649.
30. Li, X., Gu, Y., **Dvornek, N.**, Staib, L, Ventola, P., Duncan, J.S., "Multi-site fMRI Analysis Using Privacy-preserving Federated Learning and Domain Adaptation: ABIDE Results," *Medical Image Analysis*, October 2020, vol. 65, p. 101765.
31. **Dvornek, N.C.**, Li, X., Zhuang, J., Ventola, P., Duncan, J.S., "Demographic-Guided Attention in Recurrent Neural Networks for Modeling Neuropathophysiological Heterogeneity," In: *Machine Learning in Medical Imaging (MLMI 2020)*, October 2020, LNCS 12436, pp. 363-372.
32. Li, X., Zhou, Y., **Dvornek, N.C.**, Gu, Y., Ventola, P. and Duncan, J.S., "Efficient Shapley Explanation for Features Importance Estimation Under Uncertainty," In: *Medical Image*

Computing and Computer Assisted Intervention – MICCAI 2020, October 2020, LNCS 12261, pp. 792-801.

33. Li, X., Zhou, Y., **Dvornek, N.C.**, Zhang, M., Zhuang, J., Ventola, P., Duncan, J.S., "Pooling Regularized Graph Neural Network for fMRI Biomarker Analysis," In: *Medical Image Computing and Computer Assisted Intervention – MICCAI 2020*, October 2020, LNCS 12267, pp. 625-635.
34. Yang, J., Li, X., Pak, D., **Dvornek, N.**, Chapiro, J., Lin, M., Duncan, J., "Cross-Modality Segmentation by Self-Supervised Semantic Alignment in Disentangled Content Space," In: *Domain Adaptation and Representation Transfer 2020 (DART 2020)*, October 2020, LNCS 12444, pp. 52-61.
35. Zhuang, J., Tang, T., Ding, Y., Tatikonda, S.C., **Dvornek, N.**, Papademetris, X. and Duncan, J., "AdaBelief Optimizer: Adapting Stepsizes by the Belief in Observed Gradients," In: *Advances in Neural Information Processing Systems* (*NeurIPS 2020*), 2020.
36. Schirmer, M.D., Venkataraman, A., Rekik, I., Kim, M., Mostofsky, S.H., Nebel, M.B., Rosch, K., Seymour, K., Crocetti, D., Irzan, H., Hütel, M., Ourselin, S., Marlow, N., Melbourne, A., Levchenko, E., Zhou, S., Kunda, M., Lu, H., **Dvornek, N.C.**, Zhuang, J., Pinto, G., Samal, S., Zhang, J., Bernal-Rusiel, J.L., Pienaar, R., Chung, A.W., "Neuropsychiatric disease classification using functional connectomics-results of the connectomics in neuroimaging transfer learning challenge," *Medical Image Analysis*, 2021, vol. 70, pp. 101972.

Scholarship In Press

37. Wang, S. and **Dvornek, N.C.**, "A Metamodel Structure for Regression Analysis: Application to Prediction of Autism Spectrum Disorder Severity," To appear in: *International Symposium on Biomedical Imaging (ISBI)*, April 2021.
38. Zhuang, J., **Dvornek, N.C.**, Tatikonda, S. and Duncan, J.S., 2021. "MALI: A memory efficient and reverse accurate integrator for Neural ODEs," To appear in: *International Conference on Learning Representations (ICLR)*, May 2021.
39. Zhuang, J., **Dvornek, N.**, Tatikonda, S., Papademetris, X., Ventola, P. and Duncan, J., "Multiple-shooting adjoint method for whole-brain dynamic causal modeling," To appear in: *Information Processing in Medical Imaging (IPMI)*, June 2021.