

Computer Science and Artificial Intelligence Lab  
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## Education

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**Ph.D., Medical Engineering and Medical Physics** 2017 - Present  
Harvard-MIT Division of Health Sciences and Technology; Advisor: Polina Golland

**S.B., Electrical Engineering and Computer Science** 2013 - 2017  
Massachusetts Institute of Technology

## Experience

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**MIT Computer Science & Artificial Intelligence Laboratory**, Cambridge, MA Sep 2017 - Present  
*Graduate Research Assistant, Medical Vision Group*  
Developing machine learning methods for correcting corrupted Fourier-space data, enabling faster and more accurate acquisition of MRI data.

**Google, Inc.**, Mountain View, CA Jun 2018 - Dec 2019  
*Software Engineering Intern/Student Researcher, Google Brain/Google Health*  
Quantified agreement between neural network prediction explanations and human-labeled interest regions for skin condition classification, identifying potential classifier failure modes.

**Google, Inc.**, Sunnyvale, CA Jun 2017 - Aug 2017  
*Software Engineering Intern, Google Station*  
Implemented software feature to increase use of public wi-fi at international rail stops; project launched externally at 15 Google Stations in November 2017.

**IBM Research**, Cambridge, MA Jan 2017  
*Research Intern, Healthcare Analytics Group*  
Designed and conducted feature analyses to predict proteins involved in adverse drug reactions (ADRs), suggesting future experimental studies to understand ADR mechanisms.

**Nihon Kohden Innovation Center**, Cambridge, MA Jun 2016 - Jun 2017  
*Research Intern*  
Developed classifiers predicting bedside alarm relevance as a step toward reduced alarm fatigue in neonatal intensive care units.

**Charles Stark Draper Laboratory**, Cambridge, MA Jun 2015 - Aug 2015  
*Signal Processing, Algorithms, and Software Intern*  
Developed and implemented computer vision methods for GPS-free parafoil localization, enabling supply delivery to remote regions.

**MIT Media Lab**, Cambridge, MA Apr 2014 - Jun 2017  
*Undergraduate Researcher, Biomechatronics Group*  
Developed biomimetic prosthesis control systems to enable amputee walking across varied terrains.

## Publications

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### Preprints

Vasconcelos, F.\*, He, B.\*, **Singh, N.**, Teh, Y. "UncertaINR: Uncertainty Quantification of End-to-End Implicit Neural Representations for Computed Tomography." [arXiv:2202.10847](https://arxiv.org/abs/2202.10847) (2022).

**Singh, N.**, Iglesias, J., Adalsteinsson, E., Dalca, A., Golland, P. “Joint Frequency and Image Space Learning for MRI Reconstruction.” [arXiv:2007.01441](#) (2020).

### Peer-Reviewed Abstracts

**Singh, N.**, Hoffmann, M., Moyer, D.C., Jang, I., Chen, L., Bezerra Cavalcanti Rockenbach, M., Guidon, A., Aganj, I., Kalpathy-Cramer, J., Adalsteinsson, E., Fischl, B., Dalca, A., Golland, P.\*, Frost, S.\* “Joint Neural Network for Fast Retrospective Rigid Motion Correction of Accelerated Segmented Multislice MRI.” *International Society for Magnetic Resonance in Medicine Annual Meeting* (2022).

Jang, I., Frost, S., Hoffmann, M., **Singh, N.**, Chen, L., Guidon, A., Bezerra Cavalcanti Rockenbach, M., Comeau, D., Bizzo, B., Chang, K., Witham, S., Rettmann, D., Banerjee, S., Brau, A., Reese, T., Aganj, I., Dalca, A., Fischl, B.\*, Kalpathy-Cramer, J.\* “Automated MRI k-space Motion Artifact Detection in Segmented Multi-Slice Sequences.” *International Society for Magnetic Resonance in Medicine Annual Meeting* (2022).

**Singh, N.**, Iglesias, J., Adalsteinsson, E., Dalca, A., and Golland, P. “A Deep-Learning Framework for Image Reconstruction of Undersampled and Motion-Corrupted k-space Data.” *International Society for Magnetic Resonance in Medicine Annual Meeting* (2021).

Lala, S. **Singh, N.**, Gagoski, B., Abaci-Turk, E., Grant, P.E., Golland, P., and Adalsteinsson, E. “A Deep Learning Approach for Image Quality Assessment of Fetal Brain MRI.” *International Society for Magnetic Resonance in Medicine Annual Meeting* (2019). **Oral Presentation.**

### Peer-Reviewed Workshop Publications

**Singh, N.**, Lee, K., Coz, D., Angermueller, C., Huang, S., and Liu, Y. “Agreement Between Saliency Maps and Human-Labeled Regions of Interest: Applications to Skin Disease Classification.” [CVPR ISIC Workshop on Skin Image Analysis](#) (2020).

### Conference Publications

Dever, C., Dyer, T., Hamilton, L., Lommel, P., Mohiuddin, S., Reiter, A., **Singh, N.**, Truax, R., Wholey, L., Bergeron, K. and Noetscher, G. “Guided-Airdrop Vision-Based Navigation.” [24th AIAA Aerodynamic Decelerator Systems Technology Conference](#) (2017).

### Journal Publications

**Singh, N.**, Harrod, J., Subramanian, S., Robinson, M., Chang, K., Cetin-Karayumak, S., Dalca, A., Eickhoff, S., Fox, M., Franke, L., Golland, P., Haehn, D., Iglesias, E., O'Donnell, L., Ou, Y., Rathi, Y., Siddiqi, S., Sun, H., Westover, M., Whitfield-Gabrieli, S., Gollub, R. “How Machine Learning is Powering Neuroimaging to Improve Brain Health.” [Neuroinformatics](#) (2022).

Liu, Y., Jain, A., Eng, C., Way, D. H., Lee, K., Bui, P., Kanada, K., de Oliveira Marinho, G., Gallegos, J., Gabriele, S., Gupta, V., **Singh, N.**, et al. “A Deep Learning System for Differential Diagnosis of Skin Diseases.” [Nature Medicine](#) (2020).

Clites, T., Arnold-Rife, A., **Singh, N.**, Kline, E., Chen, H., Tugman, C., Billadeau, B., Biewener, A., and Herr, H. “Goats Decrease Leg Stiffness When Walking Over Compliant Surfaces.” [Journal of Experimental Biology](#) (2019).

Luo, H., Fokoue-Nkoutche, A., **Singh, N.**, Yang, L., Hu, J., and Zhang, P. “Molecular Docking for Prediction and Interpretation of Adverse Drug Reactions.” *Combinatorial Chemistry & High Throughput Screening* (2018), 21(5), 314-322.

## Teaching

**6.011: Signals, Systems, and Inference**, Cambridge, MA

Feb 2017 - May 2017

*Teaching Assistant*

Taught three weekly tutorial sections; assisted students in office hours and electronically. Rating: 6.8/7.0.

## Service

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Journal Reviewer: Nature Scientific Reports, The Journal of Machine Learning for Biomedical Imaging (MELBA)  
Conference Reviewer: NeurIPS, CVPR, ICML, ICLR, MIDL

## Invited Talks

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Closing the Gap Between Research and Clinical Application: Neuroimaging Indicators of Brain Structure and Function (Virtual Symposium)

## Awards and Honors

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Google PhD Fellowship	2021
CVPR Outstanding Reviewer	2021
National Science Foundation Graduate Fellowship	2018
National Institutes of Health Neuroimaging Training Program Fellowship	2017
Business Insider's 15 Impressive Students at MIT	2015
Intel Science Talent Search Semifinalist	2013