

Vishwajith Ramesh, Ph.D.

vramesh@health.ucsd.edu | vishramesh.com

WORK AND RESEARCH EXPERIENCE

Postdoctoral Researcher, NIH National Library of Medicine Fellow Sept. 2020 to Present
University of California, San Diego
[Dept. of Biomedical Informatics](#) + [Human-centered eXtended Intelligence Lab](#) + [Design Lab](#)

- Deploying and validating machine learning models for stroke symptom diagnosis from video and audio in active clinical environments (such as emergency departments and inpatient and outpatient clinics).
- Lead the development of a smartphone and tablet app for deploying and testing machine learning models as well as for patient data collection. Run human factors testing with healthcare professionals for user interface development.
- Lead investigator on HoloStroke, a project exploring how mixed reality technology can improve a patient's sense of immersion during telemedicine diagnosis of stroke.
- Awarded the **Senate Faculty General Campus Research Grant (\$15,000)** for "Supporting Remote Stroke Diagnostics through HoloPortation" in May 2021

Ph.D. Student Sept. 2015 to Sept. 2020
University of California, San Diego
[Human-centered eXtended Intelligence Lab](#) + [Institute for Neural Computation](#) + [Design Lab](#)

- Created tools to assess the symptoms of patients with neurological disorders, focusing on stroke, Parkinson's disease, and respiratory disease. Dissertation entitled "**Human-Centered Machine Learning for Healthcare: Examples in Neurology and Pulmonology**".
- Applied deep and machine learning techniques on patient data acquired with ubiquitous technologies - smartphones, accelerometers, depth, audio, body skeleton, and video footage from time-of-flight cameras.
- Awarded the: **Engelson Ph.D. Thesis Award (highest-rated thesis in department)** in June 2021
Siebel Scholarship, Class of 2020 (\$35,000) in Sept. 2019
NSF Graduate Research Fellowship (\$138,000) in March 2017
UCSD Chancellor's Research Excellence Scholarship (\$50,000) in January 2017

Samsung Research America Summer Intern July 2019 to Sept. 2019
Mountain View, CA

- Developed machine and deep learning classifiers for cough-based respiratory disease diagnosis, focusing on unsupervised data augmentation to boost performance.

IBM Research Summer Intern June 2018 to Sept. 2018
T.J. Watson Research Center, Yorktown Heights, NY June 2017 to Sept. 2017

- Developed a generative adversarial network deep learning pipeline to score symptoms of Parkinson's disease subjects like postural instability and gait difficulty using wearable sensor data.
- Initiated and headed a collaboration with UCSD to expand this work from clinic to at-home symptom monitoring.

EDUCATION

Ph.D. Bioengineering (M.S. 2017) Sept. 2015 to Sept. 2020
Specialization in Multiscale Biology
University of California, San Diego
GPA: 4.0/4.0

B.S. Bioengineering Sept. 2011 to June 2015
Minor in Biomedical Research
University of California, Los Angeles
GPA: 3.7/4.0 (cum laude)

ENTREPRENEURSHIP AND PROFESSIONAL ACTIVITIES

Founder & CEO May 2020 to Present
[Homni Health, Inc.](#)

- Start-up spun out of Ph.D. work on automating stroke diagnosis using machine learning. Currently in stealth.
- Participated in National Science Foundation Innovation Corps program for \$50,000 in funding for customer discovery. Conducted 100+ interviews with potential customers in 7 weeks. Won "Spirit of I-Corps" award.

Co-Founder & Vice President, Advisor
Blue LINC Healthcare Startup Incubator

July 2016 to July 2020

- Founded and lead UCSD's first health tech and biotech innovation course and incubator, based on Stanford Biodesign.

DBMI Summer Internship 2021 Planning Committee

Mar. 2021 to Aug. 2021

UCSD Department of Biomedical Informatics

- Organized a summer internship for students from underrepresented backgrounds interested in a career in biomedical informatics.
- Worked with a team of 7 doctors and academics to interview student applicants, schedule speakers, plan a terminal symposium, and speak on career advancement.

President

Mar. 2014 to June 2015

UCLA International Society for Pharmaceutical Engineering

- Led 10 officers and organized biotech recruitment events and a medical hack-a-thon for over 300 students.

Reviewer - [BioCAS 2021](#), [BioCAS 2019](#), [UbiComp 2018](#), [ISWC 2016](#)

PUBLICATIONS

Patents

Vishwajith Ramesh, Nadir Weibel, Gert Cauwenberghs, Brett C. Meyer, and Kunal Agrawal. "Diagnosing and Tracking Stroke with Sensor-Based Assessments of Neurological Deficits." *U.S. Provisional Application Serial No. _63/146,450_* Filed on Feb. 5, 2021.

Vishwajith Ramesh, Nadir Weibel, Gert Cauwenberghs, Kunal Agrawal, and Brett C. Meyer. "Identifying Weakness in Sitting Stroke Patients by Capturing Neurologist Acumen with Machine Learning." *U.S. Provisional Application Serial No. _63/153,902_* Filed on Feb. 25, 2021.

Peer-Reviewed Conference Articles

Vishwajith Ramesh, Korosh Vatanparvar, Ebrahim Nemati, Viswam Nathan, Md Mahbubur Rahman, and Jilong Kuang. "CoughGAN: Generating Synthetic Coughs that Improve Respiratory Disease Classification." *42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2020)*.

Vishwajith Ramesh, Andrew Nguyen, Kunal Agrawal, Brett C. Meyer, Gert Cauwenberghs, and Nadir Weibel. "Assessing Clinicians' Reliance on Computational Aids for Acute Stroke Diagnosis." *Proceedings of the 14th EAI International Conference on Pervasive Computing Technologies for Healthcare (PervasiveHealth 2020)*.

Vishwajith Ramesh, Andrew Nguyen, Kunal Agrawal, Brett C. Meyer, Gert Cauwenberghs, and Nadir Weibel. "Stroke-Associated Hemiparesis Detection Using Body Joints and Support Vector Machines." *ACM Proceedings of Pervasive Health 2018*.

Mustafa Ugur Daloglu, Wei Luo, Faizan Shabbir, Francis Lin, Kevin Kim, Inje Lee, Jiaqi Jiang, Wenjun Cai, **Vishwajith Ramesh**, Mengyuan Yu, and Aydogan Ozcan. "High-throughput 3D Tracking of Sperm Locomotion Reveals Head Spin and Flagellar Beating Patterns." *Conference on Lasers and Electro-Optics: Science and Innovations*. May 2018.

Journal Articles

Vishwajith Ramesh and Erhan Bilal. "Detecting Motor Symptom Fluctuations in Parkinson's Disease with Generative Adversarial Networks." *npj Digital Medicine*. In Review.

Hesham Mostafa, **Vishwajith Ramesh**, and Gert Cauwenberghs. "Deep supervised learning using local errors." *Frontiers in Neuroscience*. Aug. 2018.

Mustafa Ugur Daloglu, Wei Luo, Faizan Shabbir, Francis Lin, Kevin Kim, Inje Lee, Jiaqi Jiang, Wenjun Cai, **Vishwajith Ramesh**, Mengyuan Yu, and Aydogan Ozcan. "Label-free 3D computational imaging of spermatozoon locomotion, head spin and flagellum beating over a large volume." *Light: Science and Applications*. Aug. 2017.

Select Peer-Reviewed Abstracts, Posters, & Talks

Edward Labin, Dawn M. Meyer, **Vishwajith Ramesh**, Nadir Weibel, Kunal Agrawal, and Brett C. Meyer. "Abstract P307: The ALPHA Sign in the Diagnosis of Potential Stroke." *Stroke* 52, Suppl_1. Mar. 2021.

Vishwajith Ramesh and Nadir Weibel. "Human-Centered Design for Healthcare." Invited Talk. *Samsung Research America*. Mountain View, CA. Sept. 2018.

Vishwajith Ramesh, Kunal Agrawal, Brett C. Meyer, Gert Cauwenberghs, and Nadir Weibel. "Stroke-Associated Hemiparesis Detection Using Support Vector Machines." Talk. *EAI International Conference on Pervasive Computing Technologies for Healthcare*. New York, NY. May 2018.

Vishwajith Ramesh, Danilo Gasques Rodrigues, Janet Johnson, and Nadir Weibel. "Video Games to the Rescue!" Talk and Tech Demo. *Fleet Science Center Seminar Series*. San Diego, CA. Oct. 2017.

Vishwajith Ramesh, Kunal Agrawal, Brett C. Meyer, Gert Cauwenberghs, and Nadir Weibel. "Exploring Stroke-Associated Hemiparesis Assessment with Support Vector Machines." *Extended Abstracts of the 11th EAI International Conference on Pervasive Computing Technologies for Healthcare*. May 2017.

Vishwajith Ramesh, Steven Rick, Kunal Agrawal, Brett C. Meyer, Gert Cauwenberghs, and Nadir Weibel. "A neurobehavioral evaluation system using 3d depth tracking and computer vision: the case of stroke-kinect." *Extended Abstracts of the Society for Neuroscience Annual Conference*. Nov. 2016.

Press

Entrepreneurship:

- ["The Missing Link: UC San Diego's First Biomedical Incubator"](#) thisweek@ucsandiego 2017

Outreach:

- ["Outreach Effort Explores How Game Technology is Changing the Medical Field"](#) UCSD Computer Science 2017
- ["The Joys of Science: Torrey Pines Elementary holds Science Discovery Day in La Jolla"](#) La Jolla Light 2016

Research:

- ["Five UC San Diego Bioengineering Graduate Students Honored as Siebel Scholars"](#) UCSD News Center 2019
- ["Healthcare Meets Human-Centered Computing"](#) UCSD Computer Science 2019
- ["CSE Researchers Explore Multimodal Technology for Assessing Symptoms of Stroke"](#) UCSD Computer Science 2017