

# Vishwajith Ramesh, Ph.D.

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## 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](#) + [Design Lab](#)

- **Deploying and validating machine learning models for stroke symptom diagnosis** from video and audio in active clinical environments - emergency departments and inpatient and outpatient clinics.
- **Lead the development of a smartphone and tablet app for deploying and testing machine learning models** and for patient data collection. Run human factors testing with healthcare professionals for user interface development.
- Co-investigator and product manager on HoloStroke, a project exploring how mixed reality technology can improve a patient's sense of immersion during telemedicine diagnosis of stroke. **Manage a team of 4 mixed reality developers and liaise with third-party contractors and medical collaborators.**
- Awarded the **Senate Faculty General Campus Research Grant (\$15,000)** for "Supporting Remote Stroke Diagnostics through HoloPortation" in May 2021
- **Supervised 2 M.S. theses** in computer science - [Zhuoqun Xu](#) (now at *Intuitive Surgical, Inc.*) and [Erik Goron](#) (now at *Homni Health, Inc.*)

### Ph.D. Student

Sept. 2015 to Sept. 2020

University of California, San Diego

[Human-centered eXtended Intelligence](#) + [Integrated Systems Neuroengineering](#) + [Design Lab](#)

- Created tools to detect the symptoms of patients with neurological disorders from video and audio, 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.](#)

- **Spun a start-up out of my Ph.D. work** on detecting neurologic deficit from video and audio using machine/deep learning.

- 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.**
- **Built and currently lead an R&D team of 5** machine learning engineers, software engineers, and designers.

**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**  
UCSD Department of Biomedical Informatics

Mar. 2021 to Aug. 2021

- 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 student 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

1. **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 Feb. 5, 2021. Patent Pending.
2. **Vishwajith Ramesh**, Nadir Weibel, Gert Cauwenberghs, Kunal Agrawal, and Brett C. Meyer. **"Pose-Based Identification of Weakness."** International Patent Appl. No. PCT/US2022/017944 Filed Feb. 25, 2021. Patent Pending.

### Journal Articles

1. **Vishwajith Ramesh** and Erhan Bilal. "Detecting Motor Symptom Fluctuations in Parkinson's Disease with Generative Adversarial Networks." *npj Digital Medicine*. Accepted.
2. Hesham Mostafa, **Vishwajith Ramesh**, and Gert Cauwenberghs. "Deep supervised learning using local errors." *Frontiers in Neuroscience*. Aug. 2018.
3. 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.

### Peer-Reviewed Conference Articles

1. **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)*.
2. **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)*.
3. **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*.
4. 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.

### Select Peer-Reviewed Abstracts & Talks

1. 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.
2. **Vishwajith Ramesh**, Stephanie Kim, Hong-An Nguyen, Kunal Agrawal, Brett C. Meyer, Gert Cauwenberghs, and Nadir Weibel. "Developing Aids to Assist Acute Stroke Diagnosis." *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems – Late Breaking Work*. Honolulu, HI. May 2020.
3. **Vishwajith Ramesh** and Nadir Weibel. "Human-Centered Design for Healthcare." *Samsung Research America*. Mountain View, CA. Sept. 2018. Invited Talk.

4. **Vishwajith Ramesh**, Kunal Agrawal, Brett C. Meyer, Gert Cauwenberghs, and Nadir Weibel. "Stroke-Associated Hemiparesis Detection Using Support Vector Machines." *EAI International Conference on Pervasive Computing Technologies for Healthcare*. New York, NY. May 2018. [Talk](#).
5. Hesham Mostafa, **Vishwajith Ramesh**, and Gert Cauwenberghs. "Deep supervised learning using local errors." *Neuro-Inspired Computational Elements Workshop*. Feb. 2018.
6. **Vishwajith Ramesh**, Danilo Gasques Rodrigues, Janet Johnson, and Nadir Weibel. "Video Games to the Rescue!" *Fleet Science Center Seminar Series*. San Diego, CA. Oct. 2017. [Talk and Tech Demo](#).
7. **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.
8. Steven Rick, **Vishwajith Ramesh**, Danilo Gasques Rodriguez, and Nadir Weibel. "Pervasive Sensing in Healthcare: From Observing and Collecting to Seeing and Understanding." *Workshop on Interactive Systems in Healthcare, ACM Conference on Human Factors in Computing Systems*. May 2017.
9. **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"](#) [thistweek@ucsd.edu](mailto:thistweek@ucsd.edu) 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

## REFERENCES

- Nadir Weibel, Ph.D.  
Associate Professor at UC San Diego Computer Science and Engineering  
Director of [Human-centered eXtended Intelligence Lab](#)  
[weibel@ucsd.edu](mailto:weibel@ucsd.edu)
- Gert Cauwenberghs, Ph.D.  
Professor at UC San Diego Bioengineering  
Director of [Integrated Systems Neuroengineering Lab](#)  
[gert@ucsd.edu](mailto:gert@ucsd.edu)
- Brett C. Meyer, M.D.  
Director of [UC San Diego Stroke Center](#)  
Medical Director of UC San Diego Enterprise Telemedicine  
[bcmeyer@health.ucsd.edu](mailto:bcmeyer@health.ucsd.edu)