

# Vishwajith Ramesh, Ph.D.

[hmuvis@gmail.com](mailto:hmuvis@gmail.com) | [vishramesh.com](http://vishramesh.com)

## EXPERIENCE

### Founder & CEO

[Homni Health, Inc.](#)

May 2020 to Present

- Founder and CEO of a start-up that develops technology to detect neurologic deficits from video/audio using deep learning, spun out of my PhD work with my advisor Prof. Nadir Weibel.
- We're a team of 10, including an R&D team of 5 machine learning engineers, software engineers, and designers that I lead.
- 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.

### Postdoctoral Researcher, NIH National Library of Medicine Fellow

University of California, San Diego

[Dept. of Biomedical Informatics](#) + [Human-centered eXtended Intelligence](#) + [Design Lab](#)

Sept. 2020 to Sept. 2022

- Developed deep learning pipelines to detect neurologic deficits from video/audio of patients recorded in a clinic.
- Led the development of a tablet app for deploying machine learning models and for patient data collection. Ran human factors testing with healthcare professionals for user interface development.
- Co-investigator and lead on "HoloStroke", a project exploring how 3D holograms can improve a patient's sense of immersion during telemedicine diagnosis of stroke.
  - Managed a team of 4 mixed reality developers, third-party contractors, and medical collaborators to develop the technology and run pilot studies.
  - 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 in mixed reality and deep learning - [Zhuoqun "Robin" Xu](#) and [Erik Goron](#)

### Samsung Research America Summer Intern

Mountain View, CA

July 2019 to Sept. 2019

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

### IBM Research Summer Intern

T.J. Watson Research Center, Yorktown Heights, NY

June 2018 to Sept. 2018

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 between IBM and UCSD to expand this work from clinic to at-home symptom monitoring. Ran a data collection study with Parkinson's disease patients in San Diego.

### 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.

### Ph.D. Student, NSF Fellow

University of California, San Diego

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

Sept. 2015 to Sept. 2020

- Created tools to detect the medical symptoms in patients 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

## EDUCATION

<b>Ph.D. Bioengineering</b> (M.S. 2017) Specialization in Multiscale Biology <i>University of California, San Diego</i> GPA: 4.0/4.0	<b>Sept. 2015 to Sept. 2020</b>
<b>B.S. Bioengineering</b> Minor in Biomedical Research <i>University of California, Los Angeles</i> GPA: 3.7/4.0 (cum laude)	<b>Sept. 2011 to June 2015</b>

## PUBLICATIONS

### Patents

1. **Vishwajith Ramesh**, Nadir Weibel, Gert Cauwenberghs, Kunal Agrawal, and Brett C. Meyer. **"Pose-Based Identification of Weakness."** Filed Feb. 25, 2022. International Patent Appl. No. PCT/US2022/017944
2. **Vishwajith Ramesh**, Nadir Weibel, Gert Cauwenberghs, Brett C. Meyer, and Kunal Agrawal. **"Diagnosing and Tracking Stroke with Sensor-Based Assessments of Neurological Deficits."** Filed Feb. 5, 2022. International Patent Appl. No. PCT/US2022/015385
3. **Vishwajith Ramesh** and Erhan Bilal. **"System and method for automatic assessment of gait in Parkinson's patients."** Filed. Patent Appl. No. P201905728US01

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### Journal Articles

1. **Vishwajith Ramesh** and Erhan Bilal. **"Detecting Motor Symptom Fluctuations in Parkinson's Disease with Generative Adversarial Networks."** *npj Digital Medicine*. Sept. 2022.  
DOI: [10.1038/s41746-022-00674-x](https://doi.org/10.1038/s41746-022-00674-x)
2. Hesham Mostafa, **Vishwajith Ramesh**, and Gert Cauwenberghs. **"Deep supervised learning using local errors."** *Frontiers in Neuroscience*. Aug. 2018.  
DOI: [10.3389/fnins.2018.00608](https://doi.org/10.3389/fnins.2018.00608)
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.  
DOI: [10.1038/lsa.2017.121](https://doi.org/10.1038/lsa.2017.121)

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### 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*. July 2020.  
DOI: [10.1109/EMBC44109.2020.9175597](https://doi.org/10.1109/EMBC44109.2020.9175597)
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*. May 2020.  
DOI: [10.1145/3421937.3422019](https://doi.org/10.1145/3421937.3422019)
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."** *Proceedings of the 12th EAI International Conference on Pervasive Computing Technologies for Healthcare*. May 2018.  
DOI: [10.1145/3240925.3240979](https://doi.org/10.1145/3240925.3240979)
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*. May 2018.  
DOI: [10.1364/CLEO\\_SI.2018.STh1J.5](https://doi.org/10.1364/CLEO_SI.2018.STh1J.5)

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## Abstracts & Talks

1. **Vishwajith Ramesh**. "Towards Immersive Telemedicine Experiences for Stroke Diagnosis with Holographic Avatars." *National Library of Medicine T15 Training Conference*. Buffalo, NY. June 2022. [Talk](#).
2. 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. DOI: [10.1161/str.52.suppl\\_1.P307](https://doi.org/10.1161/str.52.suppl_1.P307)
3. **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. DOI: [10.1145/3334480.3383039](https://doi.org/10.1145/3334480.3383039)
4. **Vishwajith Ramesh** and Nadir Weibel. "Human-Centered Design for Healthcare." *Samsung Research America*. Mountain View, CA. Sept. 2018. [Talk](#).
5. **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](#).
6. **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. DOI: [10.1145/3154862.3154894](https://doi.org/10.1145/3154862.3154894)
7. **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 COVERAGE

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

## PROFESSIONAL ACTIVITIES

Summer Internship 2021 Planning Committee  
UCSD Department of Biomedical Informatics

Mar. 2021 to Aug. 2021

- Organized a summer internship program for students from underrepresented backgrounds interested in a career in biomedical informatics.

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Conference Reviewer - [IEEE BioCAS 2021](#), [IEEE BioCAS 2019](#), [Ubicomp 2018](#), [ISWC 2016](#)

## 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)