Vishwajith Ramesh, Ph.D.

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EXPERIENCE

Head of R&D — Oct. 2022 to Present
Vy Ventures

- Building out a research team to develop deep learning-based solutions for virtual reality and enterprise applications.

Founder & CEO — May 2020 to Feb. 2023
Homni Health Solutions, Inc.

- Founder and CEO of a start-up that developed technology to detect neurologic deficits (like slurring, weakness, facial droop) from video/audio using deep learning, spun out of my PhD work. Anyone could use an iPad to quickly and accurately detect strokes out in the world, especially beneficial in remote, rural areas.
- Led a team of 10, including an R&D team of 5 machine learning engineers, software engineers, and designers.
- Participated in National Science Foundation Innovation Corps program for $50,000 in funding for customer discovery. Conducted 100+ interviews with healthcare stakeholders and customers in 7 weeks. Won "Spirit of I-Corps" award.

Postdoctoral Researcher, NIH National Library of Medicine Fellow — Sept. 2020 to Oct. 2022
University of California, San Diego
Dept. of Biomedical Informatics + Human-centered eXtended Intelligence + Design Lab

- 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

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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 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 — July 2016 to July 2020
Blue LINC Healthcare Startup Incubator

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

Ph.D. Student, NSF Fellow — Sept. 2015 to Sept. 2020
University of California, San Diego
Human-centered eXtended Intelligence + Integrated Systems Neuroengineering + Design Lab

- 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

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)

PUBLICATIONS

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
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
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

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
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
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
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

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. Pending.
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. Pending.
3. **Vishwajith Ramesh** and Erhan Bilal. **"Assessing the gait of parkinson's patients."** Filed Jan. 27, 2022. U.S. Patent Appl. No. 16/938084. Pending.

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
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
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
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 2017

PROFESSIONAL ACTIVITIES

Summer Internship 2021 Planning Committee Mar. 2021 to Aug. 2021
UCSD Department of Biomedical Informatics

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

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

- **Gert Cauwenberghs, Ph.D.**

  Professor at UC San Diego Bioengineering
  Director of Integrated Systems Neuroengineering Lab
  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