Anjali Devi Sivakumar

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EDUCATION

University of Michigan **Ann Arbor, MI**

Doctor of Philosophy in Electrical and Computer Engineering *Sep 2022- Dec 2025 (Anticipated)*

GPA: 4.00 / 4.00

Coursework: BIOMEMS, Advanced MEMS, Biological Micro- and Nanotechnology

University of Michigan **Ann Arbor, MI**

Master of Science in Electrical and Computer Engineering *Jan 2021- Apr 2023*

GPA: 4.00 / 4.00

Coursework: A/D Interfaces, VLSI Design I, Analog and Integrated Circuits

SASTRA Deemed to be University **Tamil Nadu, India**

Bachelor of Technology in Electronics and Instrumentation Engineering *Jul 2015- Aug 2019*

GPA: 9.31 / 10.0

Coursework: Instrumentation System Design, Digital Signal Processing, Linear Integrated Circuits

RESEARCH EXPERIENCE

University of Michigan **Ann Arbor, MI**

Graduate Student Research Assistant *June 2021 - Present*

- Developed and prototyped a Wearable Analytical Skin Probe (WASP) to measure and monitor the dynamics of human skin to track different atopic skin diseases.
- Working on developing and prototyping a wearable, low-power, wireless, and low-cost 1D micro-gas Chromatography (μGC) system for diagnosing a wide range of diseases from human body odor.
- Assisted in developing and testing portable 1D Gas Chromatography (GC) based breath analyzers to analyze volatile organic compounds (VOC) in exhaled breath for non-invasive diagnosis of COVID-19 variants from the exhaled breath of patients in collaboration with Michigan Medicine.

Harvard Medical School – Brigham and Women's Hospital **Boston, MA**

Research Assistant *Jan 2019 – Nov 2020*

- Assisted in designing and testing microfluidics and deep learning-based self-testing rapid and accurate point-of-care diagnostic devices adaptive to emerging infectious pathogens (COVID-19, HIV, HCV, and HBV).
- Assisted in the development of portable, economical smartphone-based diagnostic systems for IVF applications.
- Collaborated with Harvard School of Public Health to study the effects of environmental exposures on semen quality and the sperm epigenome using a smartphone-based diagnostic device.
- Performed histology of different cells to train machine learning models to effectively learn the morphology of different cells at different image resolutions.
- Conducted psychophysical studies to analyze human skin's perception capability for prototyping a robust haptic glove to enhance human skin perception further.

SKILLS

Programming Languages: C, C++, Python, Embedded C, MATLAB, Verilog

Simulation Software: V-REP, LT-Spice, Multisim, Simulink, KeilUC, Cadence Virtuoso, LabVIEW, COMSOL

Rapid Prototyping Hardware: Laser cutting, 3-D Printing

Operating Systems: Windows, Linux (Ubuntu), Mac OSX

Microfabrication: Deposition, Metrology, Etching, Bonding, Lithography

Design Software: Blender, AutoCAD fusion, KiCAD, Altium

Wet Lab: Histology, Cell culture, Biosafety Level 2+

JOURNAL PUBLICATIONS

- Xiaheng Huang, Shuo Yang, Wencheng Li, Robert Nidetz, Ruchi Sharma, **Anjali Devi Sivakumar**, Chandrakalavathi Thota, Hongbo Zhu, Weishu Wu, Seong-Yong Jeong, and Xudong Fan, "Microfluidic integration of μPID on μcolumn for ultracompact micro-gas chromatography", Sensors and Actuators B: Chemical, March 2024, 135717.
- **Anjali Devi Sivakumar**, Ruchi Sharma, Chandrakalavathi Thota, Ding Ding, and Xudong Fan, "WASP: Wearable Analytical Skin Probe for Dynamic Monitoring of Transepidermal Water Loss", ***ACS Sensors 2023***, 8 (11), 4407-4416, November 2023**.**
- Xiaheng Huang, Ruchi Sharma, **Anjali Devi Sivakumar**, Shuo Yang, and Xudong Fan, "Ultrathin silica integration for enhancing reliability of microfluidic photoionization detectors", ***Analytical Chemistry 95***, 8496–8504, May 2023.
- Ruchi Sharma, Wenzhe Zang, Ali Tabartehfarahani, Andres Lam, Xiaheng Huang, **Anjali Devi Sivakumar**, Chandrakalavathi Thota, Shuo Yang, Robert P. Dickson, Michael W. Sjoding, Erin Bisco, Carmen Colmenero Mahmood, Kristen Machado Diaz, Nicholas Sautter, Sardar Ansari, Kevin R. Ward, and Xudong Fan, "Portable Breath-Based Volatile Organic Compound Monitoring for the Detection of COVID-19 During the Circulation of the SARS-CoV-2 Delta Variant and the Transition to the SARS-CoV-2 Omicron Variant", ***JAMA Network Open 6***, e230982, February 2023.
- Xiaheng Huang, Maxwell Wei-hao Li, Wenzhe Zang, Xiaolu Huang, **Anjali Devi Sivakumar**, Ruchi Sharma, and Xudong Fan, "Portable Comprehensive Two Dimensional Micro-Gas Chromatography Using Integrated Flow-Restricted Pneumatic Modulator", ***Nature Microsystems & Nanoengineering 8***, 115, November 2022.
- Aridany Suárez-Trujillo, Hemanth Kandula, Jasmine Kumar, **Anjali Devi**, Larissa Shirley, Prudhvi Thirumalaraju, Manoj Kumar Kanakasabapathy, Hadi Shafiee, Liane Hart, "Validation of a smartphone-based device to measure concentration, motility, and morphology in swine ejaculates", ***Translational Animal Science***, Volume 6, Issue 4, October 2022.
- Manoj Kumar Kanakasabapathy, Prudhvi Thirumalaraju, Hemanth Kandula, Fenil Doshi, **Anjali Devi Sivakumar,** Deeksha Kartik, Raghav Gupta, Rohan Pooniwala, John A Branda, Athe M Tsibris, Daniel R. Kuritzkes, John C Petrozza, Charles L Bormann, Hadi Shafiee, "Adaptive Adversarial Neural Networks for Lossy and Domain-Shifted Medical Image Analysis", ***Nature Biomedical Engineering***, June 2021.

PATENTS

- Xudong Fan, Xiaheng Huang, Shuo Yang, Wencheng Li, Robert Nidetz, Ruchi Sharma, **Anjali Devi Sivakumar**, Chandrakalavathi Thota, Hongbo Zhu, Weishu Wu, Seong-Yong Jeong, 'Monolithic integration of micro-gas chromatography column and micro-photoionization detector on a chip', 2023 (Patent filed).
- Xudong Fan, **Anjali Devi Sivakumar**, 'A transepidermal water loss device' (63/442,631), 2023 (Patent filed).
- Xiaheng Huang, Ruchi Sharma, **Anjali Devi Sivakumar**, Shuo Yang, and Xudong Fan, 'Protective Dielectric Layers for Enhancing Reliability of Vacuum Ultraviolet Lamps' (63/456,127), 2023. (Patent filed).

ACADEMIC HONORS AND AWARDS

- Received the **Dr. Helen Wu Award** from Rackham Graduate School for Spring/Summer 2024.
- Awarded the **Barbour Scholarship** from Rackham Graduate School for the academic year 2024-25.
- Received the **Rackham Conference Travel Grant** from Rackham Graduate School for the academic year 2024-25.
- Inducted into the **Excellence in ECE Honor Roll 2023-24** for service to the ECE department through contributions to department-specific events and programming designed to foster an inclusive, supportive community for all.
- Awarded the **Research Excellence Award** from Brigham Research Institute for outstanding contributions to research at Brigham and Women's Hospital on Nov-12,2020.
- Received the **Desh Videsh Scholarship** for pursuing my bachelor's thesis at Harvard Medical School-Brigham and Women's Hospital, MA, USA.
- Awarded the **Smt. K.Thulasi Memorial Award** for best outgoing student from the School of Electrical and Electronics Engineering amongst the graduating batch of 2019.
- Awarded the **Shri. Vishwantha Iyer Award** for best outgoing student from the Department of Electronics and Instrumentation Engineering amongst the graduating batch of 2019.
- Received the **Dean's Merit Scholarship** for being in the top 2% of UG Batch 2015-2018 in terms of academic performance.

ACTIVITIES

- **Member**, Lurie Nano Fabrication (LNF) User Committee, University of Michigan
- ***Research Mentor,*** Undergraduate Research Opportunity Program (UROP), University of Michigan, Fall 2023- Present
- **K12** ***Outreach Officer***, Graduate Society of Women Engineers (GradSWE), University of Michigan, Summer 2023-Present
- ***Active Member***, Tau Beta Pi (TBP) - The Engineering Honor Society, University of Michigan, Winter 2022 – Present
- ***Active Member***, Eta Kappa Nu (HKN) – The Electrical and Computer Engineering Honor Society, University of Michigan, Fall 2021- Present