NOELLE DAVIS

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Recent PhD graduate working on wearable, unobtrusive electronics with a focus on sensing human eccrine sweat. Interested in full-time opportunities developing sensing systems or teaching in higher education starting October 2025.

Education

University of California, Berkeley — July 2025
Ph.D. Electrical Engineering and Computer Science, advised by Dr. Ali Javey

California Institute of Technology — June 2020
B.S. Electrical Engineering, GPA: 3.8 / 4

Experience

Berkeley Sensors and Actuators Center, PhD student with Dr. Ali Javey — Aug 2020 – July 2025
- Designing sensor platforms integrating electrochemistry, electronics, microfluidics, and packaging
- Designing electrode and microfluidic patterns sensing of human eccrine sweat for roll-to-roll fabrication via screen printing on PET and TPU films, molding of PDMS, and laser cutting of adhesive films

VTT Technical Research Centre of Finland, Flexible sensors & devices, visiting researcher — Aug 2023 – Dec 2023

Caltech Nanofab Lab, undergraduate researcher with Dr. Axel Scherer — Mar 2017 – Jun 2020

NASA Jet Propulsion Laboratory, electrical systems engineering summer intern — Jun 2019 – Aug 2019

Velodyne LiDAR, electrical engineering summer intern — Jun 2018 – Aug 2018

Awards and Fellowships

2024 **Best Oral Presentation, Berkeley Sensors and Actuators Center Spring Conference**. *Voted by industry members.*
2023 **Grasshopper Adventure Series, 5-Race Series Champion, Amateur Women 20-29**. *Mixed-terrain cycling.*
2021 **National Defense Science and Engineering Graduate (NDSEG) Fellowship**
2021 **National Science Foundation (NSF) Graduate Research Fellowship (declined)**
2020 **Caltech Deans' Office Robert L. Noland Leadership Award.** *Motivating others to live out their leadership potential.*
2020 **Caltech Athletics Director's Award**. *Annual female awardee.*
2019 **Caltech Deans' Office Donald S. Clark Service Award.** *Service to the campus community & academic excellence.*
2019 **Southern California Intercollegiate Athletics Conference Women's Soccer Award of Distinction**

Publications

* indicates equal contribution

sNails: Sweat-Sensing Nails for Unobtrusive, Wearable Microfluidic Sweat Monitoring on the Dorsal Distal Phalanges. Noelle Davis, Pooja Mehta, Amanda Kang, Liam Gillan, Jussi Hiltunen, and Ali Javey. *[under revision]*

Reusable, Fully Integrated Sweat Monitor Band with Peel-and-Stick-Replacement Printed Microfluidic Sensor. Noelle Davis, Amanda Kang, Elina Hakola, Liam Gillan, Yifei Zhan, Jussi Hiltunen, and Ali Javey. *Advanced Materials Technologies*. 2025.

Electrodermal Activity as a Proxy for Sweat Rate Monitoring during Physical and Mental Activities. Seung-Rok Kim*, Yifei Zhan*, Noelle Davis*, Suhrith Bellamkonda, Liam Gillan, Elina Hakola, Jussi Hiltunen, and Ali Javey. *Nature Electronics*. 2025.

The Challenges and Promise of Sweat Sensing. Noelle Davis, Jason Heikenfeld, Carlos Milla, and Ali Javey. *Nature Biotechnology*. 2024.

Tape-Free, Digital Wearable Band for Exercise Sweat Rate Monitoring. Manik Dautta, Luis Fernando Ayala-Cardona, Noelle Davis, Ashwin Aggarwal, Jonghwa Park, Shu Wang, Liam Gillan, Elina Jansson, Mikko Hietala, Hyunhyub Ko, Jussi Hiltunen, and Ali Javey. *Advanced Materials Technologies*. 2023.

DeTagTive: Linking MACs to Protect Against Malicious BLE Trackers. Tess Despres, Noelle Davis, Prabal Dutta, David Wagner. *SNIP2+: Proceedings of the Second Workshop on Situating Network Infrastructure with People, Practices, and Beyond*. 2023.

Resettable Microfluidics for Broad-Range and Prolonged Sweat Rate Sensing. Mallika Bariya*, Noelle Davis*, Liam Gillan, Elina Jansson, Annukka Kokkonen, Colm McCaffrey, Jussi Hiltunen, and Ali Javey. *ACS Sensors*. 2022.

A Wearable Patch for Continuous Analysis of Thermoregulatory Sweat at Rest. Hnin Yin Yin Nyein, Mallika Bariya, Brandon Tran, Christine Heera Ahn, Brenden Janatpour Brown, Wenbo Ji, Noelle Davis, and Ali Javey. *Nature Communications*. 2021.

Talks

sNails: Sweat-Sensing Nails for Unobtrusive, Wearable Microfluidic Sweat Monitoring from the Dorsal Distal Phalanges.
Berkeley Institute of Design, Summer Design Seminar *July 2025*

The Challenges and Promise of Sweat Sensing.
BMW Technology Office, "Unlocking Insights with Biosensors" Workshop *February 2025*

Wearable Sweat Sensors with High-Throughput Fabrication.
Berkeley Sensors and Actuators Center Research Review *March 2024*

Teaching

Graduate Student Instructor at UC Berkeley

CS 61C, Introduction to Computer Architecture, *3x guest lectures on synchronous data systems*	summer 2025
EECS 16B, Designing Information Devices and Systems II, Head TA, 3*x guest lectures*	fall 2024 & spring 2025
Berkeley EECS 149/249a, Introduction to Embedded Systems	fall 2022

Undergraduate Teaching Assistant at Caltech

EE 10a, Introduction to Embedded Systems I	winter 2019 & 2020
EE 10b, Introduction to Embedded Systems II	spring 2019 & 2020
EE 13, Electrical Prototyping	fall 2019
EE/ME 7, Intro to Mechatronics	fall 2018

Advising

Undergraduate Researchers

Luis Fernando Ayala Cardona (now PhD student at Northwestern University)	spring 2021 – fall 2022
Ashwin Aggarwal (now software engineer at Salesforce)	fall 2021 – spring 2023
Yifei Zhan (now PhD student at UC Berkeley)	spring 2023 – fall 2023
Nicole Qing (now PhD student at Northwestern University)	summer 2023 – spring 2024
Kalynna Tang	fall 2023 – spring 2024
Meera Devine (Bakar Ignite Scholar)	spring 2024 – fall 2024
Amanda Kang (Bakar Ignite Scholar)	spring 2024 – spring 2025
Pooja Mehta	fall 2024 – spring 2025

Technical Skills

Circuits	*Eagle, LTSpice, DipTrace*	***Firmware***	*ARM Cortex-M4, BLE*	***Software***	*Python, C/C++/C#, MATLAB*	***CAD***	*AutoCAD, SolidWorks*	***Design***	*Photoshop, InDesign, Illustrator*