Aya Mouallem

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EDUCATION

Ph.D.	Department of Electrical Engineering, Stanford University, 2025 (expected)
	Dissertation: Improving the Accessibility of Electrical and Computer Engineering (ECE) Education to Learners Who Are Blind or Have Low-Vision
	Committee: Sheri Sheppard (Mechanical Engineering), Mark Horowitz (Electrical Engineering), Brad Osgood (Electrical Engineering), Sean Follmer (Mechanical Engineering)
	Ph.D. Minor: Learning, Design, and Technology, Stanford Graduate School of Education
	Research Areas: Engineering education, accessibility, human-computer interaction
M.S.	Department of Electrical Engineering, Stanford University, 2023
B.Eng.	Department of Electrical and Computer Engineering, American University of Beirut, 2020

RESEARCH EXPERIENCE

10/2021–Present Graduate Researcher, Designing Education Lab, PI: *Sheri Sheppard,* Stanford University
Projects:
- The CARE methodology: a new lens for introductory Electrical and Computer Engineering (ECE) course assessment based on student Challenging And Rewarding Experiences (CARE)
- A collaborative autoethnography on inequitable barriers faced by a blind student in ECE
- Design criteria for inclusive engineering education technology-based tools
- Design, development, and evaluation of an accessible electronics circuit simulator tool for blind and low vision learners in engineering, with ability-based and universal design principles
- Evaluation of the long-term impacts of project-based learning in design education

03/2024–Present Collaborating Researcher, Maalouf Group, PI: *Elsa Maalouf*, American University of Beirut
Projects:
- A longitudinal analysis of women's representation in engineering education in Lebanon
- An analysis of women's pathways in engineering education and careers in the Middle East

09/2020–10/2021 Graduate Research Assistant, Mixed-Signal Circuits Group, PI: *Boris Murmann*, Stanford University
Project: Pseudo-resistor cell design for an implantable chip to restore vision for blind individuals

09/2018–07/2020 Research Assistant, Kanj Group, PI: *Rouwaida Kanj*, American University of Beirut
Project: In-memory computing circuit design for a Kohonen neural network (KNN) application

PUBLICATIONS

Peer-Reviewed Conference Proceedings

2024 **A. Mouallem**, T. Kulkarni, and S. D. Sheppard (in print). "Leveraging the CARE Methodology to Enhance Pedagogical and Institutional Support for Blind or Low-Vision (BLV) Electrical and Computer Engineering (ECE) Learners," *The Annual American Society for Engineering Education (ASEE) Conference and Exposition.* Portland, OR, USA. ***Nominated for Best Diversity Paper Award (conference-wide); Won Best DEI Paper Award (ECE division)***

2024 S. Travaglini, **A. Mouallem,** and S. D. Sheppard (in print). "Designing good practices for recruitment, admissions and program structure of engineering outreach programs to increase access for marginalized and non-traditional higher education students," *The Annual American Society for Engineering Education (ASEE) Conference and Exposition.* Portland, OR, USA.

2023 T. Kulkarni, G. Kim, and **A. Mouallem**. "A Case for Improving the Accessibility of Electrical and Computer Engineering Education – Starting with a Blind Student's Autoethnography." *Proceedings of the 25th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS).* New York, NY, USA.

2023 **A. Mouallem**, M. Horowitz, and S. D. Sheppard. "The CARE methodology: a new lens for introductory ECE course assessment based on student Challenging And Rewarding Experiences." *Proceedings of the Annual American Society for Engineering Education (ASEE) Conference and Exposition.* Baltimore, MD, USA.

2023 F. Kempf, N. Elfiki, G. Toye, H. L. Chen, **A. Mouallem**, M. Lande, and S. D. Sheppard. "The Nexus of Entrepreneurship and Innovation — A new approach to looking at the creative contributions of engineering graduates." *Proceedings of the Annual American Society for Engineering Education (ASEE) Conference and Exposition.* Baltimore, MD, USA.

2022 **A. Mouallem**, H. Fadlallah, L. Bacha, D. El Hajj, R. Jamil, D. Bazazo, and R. Kanj. "1T1R In-Memory Compute for Winner Takes All Application in Kohonen Neural Networks." *Proceedings of the IEEE International Symposium of Circuits and Systems (ISCAS).* Austin, TX, USA.

Book Chapters

2023 S. D. Sheppard, H. L. Chen, G. Toye, **A. Mouallem**, M. Lande, L. Shluzas, T. Bunk, N. Elfiki, J. L. Lamprecht, and K. Prantl. "Decades of Alumni — Perspectives on the impact of project-based learning on career pathways and implications for design education." *Design Thinking Research.* Springer.

In Preparation

A. Mouallem and S. D. Sheppard. "Evaluating the Learning Outcomes of an Accessible Electronic Circuit Simulator Tool for Blind and Low Vision Learners in Introductory Electrical and Computer Engineering." (to submit to the *Journal of Engineering Education*)

A. Mouallem, M. Mendez-Pons, A. Malik, G. S-H Kim, T. Kulkarni, C. Chong, D. Fan, and S. D. Sheppard. "An Accessible Electronic Circuit Simulator for Blind and Low Vision Learners." (to submit to *The Annual ACM Conference on Human Factors in Computing (CHI), 2025*)

A. Mouallem and S. D. Sheppard. "Co-Designing an Engineering Education Tool with the Blind and Low-Vision Community." (to submit to *The Annual American Society for Engineering Education (ASEE) Conference, 2025*)

A. Mouallem, T. Kulkarni, G. S-H Kim, and S. D. Sheppard. "The Lived Curriculum of Blind and Low Vision Learners in Electrical and Computer Engineering (ECE): A Call for a Disability-Centric Curricular Transformation." (to submit to the *IEEE Transactions on Education*)

R. Malaeb, J. Sabra, **A. Mouallem**, and E. Maalouf. "Breaking the Barriers: An Analysis of Women's Representation in Various Engineering Disciplines in the Middle East." (to submit to the *Journal of Engineering Education*)

CONFERENCE ACTIVITY

Conference Talks

2024 Leveraging the CARE Methodology to Enhance Pedagogical and Institutional Support for Blind or Low-Vision (BLV) Electrical and Computer Engineering (ECE) Learners, *The Annual American Society for Engineering Education (ASEE) Conference and Exposition,* Portland, OR, USA.

2023 The CARE methodology: a new lens for introductory ECE course assessment based on student Challenging And Rewarding Experiences, *The Annual American Society for Engineering Education (ASEE) Conference and Exposition,* Baltimore, MD, USA.

2022 1T1R In-Memory Compute for Winner Takes All Application in Kohonen Neural Networks. *IEEE International Symposium of Circuits and Systems (ISCAS)*, Virtual.

Posters

2024 **A. Mouallem**, M. Mendez-Pons, A. Malik, G. S-H Kim, T. Kulkarni, C. Chong, D. Fan, H. L. Chen, O. Tomassetti, and S. Sheppard. An Accessible Electronics Simulator for Blind and Low-Vision (BLV) Students: Preliminary Findings from Co-Designing with the BLV Community." *Stanford Mechanical Engineering Conference (MECON)*, Stanford, CA, USA. ***Won Best Poster Award.***

2023 T. Kulkarni, G. Kim, and **A. Mouallem**. "A Case for Improving the Accessibility of Electrical and Computer Engineering Education – Starting with a Blind Student's Autoethnography." *The 25th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS),* New York, NY, USA.

Workshops

2022 "Assessing the Impact of Project-based Design Education in Engineering on Alumni, Current Students, and Educators," *The Hasso Plattner Design Thinking Research Program (HPDTRP) Community Workshop,* Stanford, CA, USA.

TEACHING EXPERIENCE

Stanford University, Sole Instructor

01/2024–03/2024 Electrical Engineering Instruction (EE 195)

Upper division level, 6 students, course advisor: Mark Horowitz, 9 weeks

- Taught weekly sessions on evidence-based practices to improve ECE teaching skills for students who are interested in assisting with or teaching undergraduate ECE courses

- Integrated additional course content on debugging, experiential and collaborative learning opportunities, learning theories, and reflection-based homework assignments

Stanford University, Teaching Assistant

03/2024–06/2024 Designing for Accessibility (CS 377Q)
Upper division level, 32 students, 1 teaching assistant, course professor: John Tang, 10 weeks
- Graded and provided feedback on weekly assignments spanning human-computer interaction, human-centered design, accessibility, and programming
- Held weekly office hours focused on programming, user study design, and prototyping
- Gave a lecture on accessibility-centric design frameworks (e.g., ability-based design)
- Updated the course material to integrate recent technical developments in AI and accessibility

01/2024–03/2024 An Intro to Making: What is Electrical Engineering (ENGR 40M)
Mixed undergraduate level, 85 students, 11 teaching assistants, course professor: Mark Horowitz, 10 weeks
- Taught weekly lab sessions spanning four core course projects
- Provided feedback on prelab assignments, lab skills, and the build quality of projects
- Held weekly office hours, exam review sessions, and additional one-on-one support for struggling students, international students, and first-generation, low-income (FLI) students

University of Korçë, Primary Instructor

07/2023 Human-Centered Technology Design Mindsets
Pre-college level, 15 students, 1 teaching assistant, program: Code for Albania, 2 weeks
- Expanded the curriculum and led daily lectures on the design thinking process, wireframing, UX design, and design justice
- Hosted Python programming support clinics and served as a judge for the final hackathon

American University of Beirut, Sole Instructor

07/2018 Engineering for Good Youth Summer Program
Pre-college level, 20+ students, 2 weeks
- Created the introductory electronics curriculum for the summer program
- Led a lecture on electronics for Arduino-based hardware design and provided mentorship on pathways to higher education for first-generation, low-income (FLI) students

American University of Beirut, Teaching Assistant

07/2018–08/2018 Electronics
Upper division level, 40+ students, 2 teaching assistants, course professor: Ayman Kayssi, 10 weeks
- Corrected weekly homework assignments and quizzes

RESEARCH ADVISING AND MENTORSHIP

Legend: ***** Co-authored one or more publications

Stanford University

2024–Present Trini Rogando, Undergraduate STEM Research Fellow
Project: Accessible UX design for blind and low vision learners in electrical engineering

2024–Present Shloke Patel, Undergraduate Research Assistant
Projects: Sonification of alternating signals in circuit simulations; Visual-Verbal Video Analysis

2024–Present Mirelys Mendez-Pons, Undergraduate STEM Research Fellow
Projects: Prototyping accessible engineering ed-tech tools; User study design and facilitation

2023 Gene Sung-Ho Kim*****, Undergraduate Research Assistant
Projects: Ed-tech co-design; Comparative analysis of accessibility-centric ed-tech design practices

2022–2024 Trisha Kulkarni***,** Undergraduate and Master's Research Assistant
Projects: Autoethnography; Co-design workshop facilitation; Qualitative coding and analysis

2023 Itbaan Nafi, Obama-Chesky Voyager Undergraduate Scholar
Project: Design and implementation of a human-centered design curriculum in Bangladesh

American University of Beirut

2024–Present Jana Sabra, Master's Research Assistant
Project: Qualitative analysis of women's pathways post-engineering education in the Middle East

FELLOWSHIPS AND AWARDS

Academic Fellowships

2024–2026 Diversifying Academia, Recruiting Excellence (DARE) Fellowship *($109,600)*
2022–2025 Research, Action, and Impact through Strategic Engagement (RAISE) Fellowship *($46,800)*
2020–2023 Knight-Hennessy Scholarship, with a 1.2% acceptance rate and 5,000+ applicants *($307,280)*

Academic Awards

2024 Best Diversity, Equity, and Inclusion Paper Award in the ECE Division at the American Society for Engineering Education (ASEE) Conference
2024 Stanford Centennial Teaching Assistant Award
2024 Best Poster Award at the Stanford Mechanical Engineering Conference (MECON)
2023–2024 Stanford Human-Centered AI (HAI) Affinity Grant
2023 Stanford Engineering Dean's Advisory Council Exceptional Master's Student Award
2020 Penrose Award at the American University of Beirut *(awarded to one graduating student per faculty)*
2020 Electrical and Computer Engineering Best Final Year Project Award in the Hardware Systems Category at the American University of Beirut

Community Outreach Fellowships and Awards

2021–2023 The United Nations Women Gender Innovation Agora Fellowship
2019 The Diana Award, in memory of Princess Diana, awarded to select youth scaling social impact
2018 The Siniora Baassiri Exceptional Volunteer of the Year Award, American University of Beirut
2018 Johnson & Johnson Fellow
2018–2020 Women Deliver Young Leader Fellow

SERVICE

To University

12/2023 *Program Lead,* Research on Accessible Design (RAD), Stanford University
Welcomed blind participants from our newly established community partnership with LightHouse for the Blind and Visually Impaired to a co-design workshop, ECE education activities, and panels with blind engineers and scientists at Stanford

10/2023–12/2023 *Art Committee Member*, Knight-Hennessy Scholars Program, Stanford University
Co-organized the inaugural Denning House art night, open to members of the Bay Area and was involved in the successful acquisition of a new indigenous art installation

06/2021–Present *Admissions Ambassador,* Knight-Hennessy Scholars Program, Stanford University
Hosted online and in-person admissions sessions for 500+ attendees in the Middle East

10/2022–11/2022 *Admissions Committee Member*, Accel Leadership Program, Stanford University

To Community

05/2022–Present *Founder and Program Lead*, The LebNet Tech Fellows Program | lebnet.us/TechFellows
The LebNet Tech Fellows Program is the first comprehensive technology fellowship in Lebanon, creating pathways for undergraduate students in engineering into technology careers and higher education programs

- Led 10+ program sessions on technical and soft skills development
- Created a direct internship pipeline to offerings by LebNet startups and company executives
- Scaled the program capacity by 250% to welcome 99 fellows across the country in 2024

2017–Present *Founder and Advisory Board Member,* All Girls Code | www.allgirlscode.me
All Girls Code is an award-winning initiative that runs free STEM programs for young girls in the MENA

- Led the curricular development efforts, covering the technical and design curricula
- Scaled the initiative offerings to 700+ alumni and to provide post-program support
- Served on recruiting committees and expanded the team to more than 30 full-time volunteers
- Launched the ongoing, annual summer internship program, with 30+ interns to date
- Launched a year-round mentorship program, resulting in around 80% of university-bound mentees pursuing STEM majors and relevant scholarships

04/2021–11/2022 *Ad Hoc Committee Member on Diversity*, IEEE Solid-State Circuits Society

SELECTED SPEAKING ENGAGEMENTS

Invited Panels

06/06/2024 "Accessibility Research and Accessible Technology Design," Stanford Code in Place
09/15/2023 "Community-Based Research and Public Scholarship," Stanford Graduate Summer Institute
05/12/2022 "Purposeful Leadership in the 21st Century: Accessibility of STEM Education to Women and Refugees," The Owners Forum (with John Hennessy)

Invited Talks

09/30/2021 "Leadership in Conflict Zones and Service in Vulnerable Communities," Global Leaders and Innovators in Human and Planetary Health, Stanford University
06/12/2018 "Youth and Technology in the Global South," Devex World Conference

OUTREACH AND LEADERSHIP

03/08/2024	Fireside chat moderator, Women in Data Science (WiDS) Global Conference
08/19/2023	Invited panelist, Al-Ghurair Foundation for Education in the Arab World
03/09/2021	Fireside chat moderator with Melinda Gates, McMurtry Leadership Lecture
08/12/2019	Interviewer with Malala Yousafzai, The Deliver for Good Campaign, Women Deliver

PROFESSIONAL MEMBERSHIPS

Association of Computing Machinery (ACM), *Student Member*
American Society for Engineering Education (ASEE), *Student Member*
Institute of Electrical and Electronics Engineers (IEEE), *Student Member*

MEDIA

2024	*Podcast:* Advocating for Inclusivity in STEM Education, ***Knight-Hennessy Scholars*** (link)
2024	RAISE Fellows Elevate Community-Engaged Research, ***The Stanford Report*** (link)
2024	Engineering Accessibility, ***The Stanford Report*** (link)
2023	*Op-ed:* Paving the Way for Lebanon's Next Generation of Women in STEM, ***Wilson Center*** (link)
2021	10 Women Changing the Landscape of Leadership Worldwide, ***The New York Times*** (link)
2020	This Engineer Used Her STEM Skills to Help Beirut Explosion Victims, ***Forbes*** (link)

REFERENCES

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Additional references available upon request.