Rachel Adénękàn

PhD Candidate
Mobile, Wearable, & Digital Health Tech

I work at the interface of engineering and medicine to develop novel technologies that enable and encourage humans to live healthier lives.

Contact

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Education

2024
Stanford University
PhD in Mechanical Engineering
(biomedical focus)

2019
Stanford University
M.S. in Mechanical Engineering

2017
MIT
S.B. in Mechanical Engineering
Minor: Music

Skills

Digital Health Technologies Research Design, Execution, and Analysis

Sensor data processing and analysis (esp. related to health sensing, mobile devices, and wearables)

Data Analysis & Visualization

Building and leading collaborations between engineers and clinicians

Technical writing and presenting

Honors

National Science Foundation Graduate Research Fellow

Stanford Enhancing Diversity in Graduate Education Fellow

Stanford Graduate Fellow (Medtronic Foundations Fellow)

MIT Lincoln Labs Undergraduate Research and Innovations Scholar

Selected Experiences

Stanford University   **Jan 2022 - Present**
Collaborative Haptics and Robotics in Medicine Laboratory
PhD Candidate with Prof. Allison Okamura
Co-advisors: Prof. Cara Nunez (Cornell University), Prof. Scott Delp

Developing and deploying a high-resolution, reproducible, and accessible (to clinicians and patients) screening method for Diabetic Peripheral Neuropathy (DPN) using a smartphone which can identify individuals at risk for DPN prior to overt clinical manifestation and at a potentially reversible stage.

- Characterized smartphone vibrations and tuned their governing parameters to measure clinically relevant sensory response in humans
- Evaluated the reliability and resolution of the smartphone-based platform in measuring human vibration perception thresholds via one-day, in-lab and multi-day, at-home user studies with over 60 participants
- Built and led clinical collaborations with endocrinologists, neurologists, and primary care physicians at Stanford Hospital to evaluate the performance of the smartphone-based platform in classifying over 100 patients with varying levels of risk of developing diabetic peripheral neuropathy
- Performed various statistical tests (ANOVAs, multivariate regressions, etc) and made various scientific figures to analyze the relationship between relevant electronic health record (EHR) data, health survey data, and experimentally collected perception data
- Contributed significantly to grants to support the project (awarded): Stanford Center for Digital Health (*$50k, wrote grant and submitted independently*), Stanford Precision Health and Integrated Diagnostics (*$200k, contributed figures and text*), Stanford Diabetes Research Center (*$25k, contributed figures and text*)
- Presented project findings at various conferences, seminars, and journals: BioRob Conference 2022, IEEE Transactions on Haptics 2024 (paper accepted), IEEE Haptics Symposium 2024 (paper accepted), etc

Biomechatronics Laboratory   **Jan 2018 - Nov 2021**
Research Fellow with Prof. Steve Collins and Prof. Scott Delp

Developed methods of controlling wearable robotic devices (exoskeletons) to enhance balance ability in older adults.
- Developed real-time controllers for exoskeletons that output assistive torque based on the user's state
- Planned and executed human subject pilot experiments using biomechanics tools (EMG, Respirometry, Motion Capture, Force plates) and simulation platforms (OpenSim) to study human response to exoskeletons

Mechatronics Design Sequence   **Sep 2017 - March 2018**
ME218 Project Member

- Devised multiple user interactions using event driven programming, IR sensing and audio input to control system behaviors.
- Integrated visual, audio, and haptic feedback based on user input and system state.

Leadership Roles and Outreach

- New Creation Home Volunteer with At-Risk Young Moms in East Palo Alto (2018-Present)
- MIT Club of Northern California, Digital Health Track Volunteer (2024 - Present)
- MIT Admissions Interviewer (2022 - Present)
- Stanford Vice Provost for Graduate Education (VPGE) Student Employee (2022 - Present)
- Stanford VPGE New Graduate Student Orientation Invited Speaker (2023)
- Stanford Summer Undergraduate Research Fellowship Mentor (2022 and 2023)
- Stanford Exposure to Research and Graduate Education (SERGE) Panelist (2022 and 2023)
- Stanford Enhancing Diversity in Graduate Education Mentor (2021-2023)
- Stanford Summer First Mentor (2022)
- Neuromuscular Biomechanics Lab Outreach Committee Member (2020-2022)
- Teaching Assistant for Stanford's Biomechanics of Movement (ME281) course (2021)
- Stanford School of Engineering Graduate Student Recruiter (2019-2020)
- Brains On, Kids Science Podcast, Guest Speaker (2020)
- Stanford SERGE Application Reviewer (2020)
- Stanford STEM Fellows Mentor (2019-2020)
- Bay Area Graduate Pathways to STEM Committee Member and Advisor (2018-2019), Mentor (2023)
- MIT Global Teaching Labs Instructor (2017)
- MIT's Design For America, Service and Outreach Team Co-Founder (2015-2016)