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Abena Boadi-Agyemang

Robotics Institute, Carnegie Mellon University
5000 Forbes Ave
Pittsburgh, PA, 15213

aboadiag@andrew.cmu.edu
https://aboadiag.github.io/aba-portfolio

Research statement

As a researcher, I am passionate about creating technology that empowers people. My research interests are primarily within the space of *accessibility* and *human-machine interaction*. I focus on creating socially assistive agents to promote human mental wellbeing and assistive robots to support people with disabilities with their daily tasks. I leverage tools from across disciplines, including robotics, design research, HRI, HCI, and psychology. **I am currently looking for research intern positions focused on *human-robot* or *human-AI interaction* for summer 2025.**

Education

Ph.D. Robotics	Carnegie Mellon University, Expected 2026 Advisor: Aaron Steinfeld
M.S. Robotics	Carnegie Mellon University, 2025 Advisor: Aaron Steinfeld
B.S. Mechanical Engineering	Stanford University, 2021 Focus: Dynamic Systems and Controls

Research Experience

Graduate Research Assistant 2021 -	Robotics Institute, Carnegie Mellon University Designing robot-mediated tools and assistive robotics aids to support people with people with disabilities.
Undergraduate Research Assistant 2019 - 2021	Mechanical Engineering Department, Stanford University SHAPE Lab (PI: Sean Follmer) Designed assistive haptic devices for blind and low vision users and learners.
Undergraduate Research Assistant 2018 - 2019	Clayman Institute for Gender Research, Stanford University PI: Melisa Abad Examined language in corporate leadership statements to inform gender inclusivity interventions.
Undergraduate Research Assistant 2017 - 2018	Graduate School of Education, Stanford University PI: John Willinsky Examined and catalogued predatory journals (from "Beall's List") and prepared contact database for journal integrity intervention participation.

Academic Publications

(* denotes equal contribution. Google Scholar for full papers)

Book Chapters **(Peer Reviewed)**

[B1] Siu, A. F., Chase, E. D. Z., Kim, G. S. H., **Boadi-Agyemang, A**, Gonzalez, E. J., and Follmer, S. (2021). Haptic Guidance to Support Design Education and Collaboration for Blind and Visually Impaired People. In *Plattner H., Design Thinking Research. Understanding Innovation. Springer.*

Journal Articles **(Peer Reviewed)**

[J1] Carter, Lopez, Sun, Warrier, Wu, Ng, Wang, **Boadi-Agyemang**, Tomasic, Zimmerman, and Steinfeld. Designing Future Smartphone Apps for Navigation, Exploration, and Object Identification with Blind Users. *Under Review.*

[J2] Shih, K.*, **Boadi-Agyemang, A.***, Carter, E.J., Steinfeld, A. A Multi-Method Investigation of Guide Robot Characteristics for Blind and Low Vision Users. *Under Review.*

Conference Papers **(Peer Reviewed)**

[C1] **Boadi-Agyemang, A**., Schaldenbrand, P., Misra, V., Carter, E.J., Oh, J., Steinfeld, A. (2025). If I Move, Do You Move? Investigating the Role of Interpersonal Synchrony in Human-Robot Joint Painting. Forthcoming In *The 34th IEEE International Conference on Robot and Human Interactive Communication (RO-MAN).*

[C2] Han, V. Y., **Boadi-Agyemang, A.**, Lin, Y., Lindlbauer, D., and Ion, A. (2023). Parametric Haptics: Versatile Geometry-based Tactile Feedback Devices. In *The 35th Annual ACM Symposium on User Interface Software and Technology* (*UIST*).

Short Papers **(Peer Reviewed)**

[S1] **Boadi-Agyemang, A.*** and Park, M.*. (2024). Designing Interactive Agents to Support Emotion Regulation in the Workplace through Guided Art-Making. In *Companion of the 2024 ACM/IEEE International Conference on Human-Robot Interaction (HRI).*

[S2] **Boadi-Agyemang**, **A**., Carter, E.J., Siu, A. F., Steinfeld, A., and Martinez, M.O. (2023). Understanding Experiences, Attitudes, and Perspectives towards Designing Interactive Creative Tools for Teachers of Visually Impaired Students. In *The 25th International ACM SIGACCESS Conference on Computers and Accessibility* (*ASSETS*).

[S3] Kim, L. H.*, **Boadi-Agyemang**, **A**.*, Siu, A. F., and Tang, J. (2020). When to Add Human Narration to Photo- Sharing Social Media. In *The 22nd International ACM SIGACCESS Conference on Computers and Accessibility* (*ASSETS*).

[S4] Chase, E. D. Z., Siu, A. F., **Boadi-Agyemang, A.**, Kim, G. S. H., Gonzalez, E. J., and Follmer, S. (2020). PantoGuide: A Haptic and Audio Guidance System to Support Tactile Graphics Exploration. In *The 22nd International ACM SIGACCESS Conference on Computers and Accessibility* (*ASSETS*).

Workshop **(Non-Archival, Lightly Reviewed)**

[W1] **Boadi-Agyemang, A.*,** Moharana, S.* (2025). The Case for Em(body)ed Approaches to Disability-Centered Interaction Design. In Workshop, *"Body Politics: Unpacking Tensions and Future Perspectives for Body-Centric Design Research in HCI" (ACM CHI 2025).*

[W2] **Boadi-Agyemang**, **A.***, Shih, K.* and Steinfeld, A. (2023). Discovering User Needs and Preferences for Guide Robots: Challenges and Preliminary Insights. In *Workshop "Assistive Robots for Citizens" at IEEE/RSJ Conference on Intelligent Robots and Systems (IROS 2023).*

Theses

[T1] **Boadi-Agyemang, A**. (2024). Simulated Encounters of the Third Kind: Scenario-Based Approach to Designing Guide Robots. Master's Thesis. Carnegie Mellon University.

[T2] Perez, G. A.*, **Boadi-Agyemang, A**.*, Mhatre, K.*, Wang, J.* (2021). Using a Vibrotactile Stimulation Device to Improve Knee Extension During Stance Phase in Children with Spastic Cerebral Palsy. Undergraduate Capstone, Stanford University. **[Nominated for Hoefer Prize for Writing in the Major]**

Teaching Experience

Teacher Assistant, Introduction to Human-Robot Interaction (16-467), Undergraduate Level Course — 2025
Course co-taught by Zackory Erickson, PhD, and Michelle Zhao at Carnegie Mellon University. Advised and mentored undergraduate research projects; held weekly office hours; graded weekly homework and final assignments

Teacher Assistant, Sensing and Sensors (16-722), Graduate Level Course — 2023
Course taught by Professor Cameron N. Riviere, PhD, Carnegie Mellon University. Taught lecture on Intro to Odometry & Kalman filtering; held demo lecture on using Arduino and various sensors. Held weekly office hours; graded weekly homework and lab assignments

Honors and Awards

Cadence Diversity in Technology Scholarship — 2023
Award ($5k) to a student who exemplifies leadership and demonstrates a passion for technology

Carnegie Mellon University's *Uber Presidential PhD Fellowship* — 2022 - 2023

University of Washington College of Engineering Dean's Fellowship *(declined)* — 2021
Graduate fellowship award for top incoming doctoral applicants ($10k/yr) (Nominated by HCDE)

University of Washington Top Scholar Fellowship *(declined)* — 2021
Award to attract outstanding students to the University of Washington ($2.5k)

Access_&Design Fellowship — 2021
Design fellowship for emerging BIPOC designers

Stanford Mechanical Engineering Summer Undergraduate Research Institute **(SURI)** — 2019, 2020
Research fellowship ($7.5k) to conduct and present ten-week, original research project

Academic Award of Excellence — 2018, 2019
Recipient for outstanding academic achievements, awarded by Stanford University Black Community Services Center

Botswana *Top Achievers Award and Scholarship* — 2017
Selective full university scholarship for stellar academic achievement, awarded by Botswana's Ministry of Education

American University Preparatory School Global Leadership Merit Scholarship — 2014 -2017
Three-year academic scholarship for a student with exemplary leadership qualities

Academic Service

Reviewer

IEEE International Conference on Robot and Human Interactive Communication	2025 -
ACM/IEEE International Conference on Human Robot Interaction	2023 -
ACM CHI Conference on Human Factors in Computing Systems	2023

Volunteer Service & Outreach

Gender Marginalized Lunch **Coordinator** — 2022 -
Organizing lunches to foster community between gender marginalized PhD students within the Robotics Institute: securing departmental funds during summer to continue lunches; assisted with organizing the School of Computer Science wide PhD Women's lunch

Lab Outreach Manager, Carnegie Mellon University — 2022 -2023
Collaborated on efforts to create pathways to engineering for students from marginalized identities

Seeds of Change **Leader** — 2020 -2021
Lead and mentor high school students to increase representation of girls and women in STEM fields

Rewriting the Code **Fellow** — 2019 - 2021
Fellowship for women in computing and STEM fields

Phoenix Scholars **Mentor** — 2017 - 2018
Provide college application mentorship for minority students

Educate A Generation Initiative **Founder** — 2015 - 2017
Lead hands on STEM workshops for students in low-resourced communities (in Pasadena, CA and Francistown, Botswana)

Research Supervised

Undergraduate Interns
Janika Oh, Undergraduate, Mechanical Engineering + Music Tech, Carnegie Mellon University — 2022

High School Summer Interns
Sam Kuzmishin — 2022

Coursework (graduate-level, CMU)

Intro to Robot Learning (16831)*; Kinematics, Dynamics, and Control (16711); Advanced Mechatronics Design (16878); Engineering Haptic Interfaces (16-880); Sensing & Sensors (16722); Math Fundamentals in Robotics (16811); Human Robot Interaction (16867)

Skills

Robotics:

1. **Robots:** Misty II (Furhat Robotics) – PythonS SDK, HTTP API; Pioneer 3-DX
2. **Frameworks & APIs:** PyTorch*, TensorFlow*, Gymnasium (OpenAI)*, ROS
3. **Physics simulators*:** MuJoCo

***Experience gained through graduate-level coursework at CMU

Research Methods:

1. **Quantitative:** experimental design
2. **Qualitative**: participatory design: interview, focus groups, survey; HCI methods (cognitive task analysis: contextual inquiry, think aloud; A/B testing; usability)
3. **Qualitative Analysis**: (reflexive) thematic analysis, affinity diagramming
4. **Statistical Analysis**: JMP, Matlab, R

Programming: Python, MATLAB, C, C++, Java, HTML

Mechatronics: embedded systems, event-driven programming, circuit design

Design software:

1. **UX:** Adobe Xd, Figma
2. **CAD & CAE**: SolidWorks, Fusion 360
3. **Other**: Processing, Unity 3d, Adobe Illustrator, Miro

Fabrication: Laser Cutting, 3D Printing (FDM, SLA)

Manufacturing: Mill, Lathe, Form (sheet metal), Metal Joining (oxyacetylene weld), Waterjet Cutting, Woodworking, Sand Casting, Silicone Molding