

# De'Aira Gladys Bryant, Ph.D.

**e:** deairabryant@gmail.com  
**w:** www.deairabryant.com

**in:** <https://www.linkedin.com/in/deairabryant/@DeeGotRobots>

## Research Interests

My research interests lie at the intersection of artificial intelligence, human-robot interaction (HRI), and AI ethics. I design, develop and evaluate intelligent systems that incorporate subjective user data for enhanced, adaptive, and inclusive interactions between human users and social robots. As robots take on more dynamic and unstructured social spaces, these systems and methodologies will allow them to engage and adapt to a broad range of users with a greater understanding of social context and nuance.

## Education

### Georgia Institute of Technology, Atlanta, GA

August 2017 – May 2024

Doctor of Philosophy in Computer Science

College of Computing, School of Interactive Computing – Intelligent Systems Focus

**Dissertation:** Bias in the Eyes of the Beholder: Development of a Bias-Aware Facial Expression Recognition Algorithm for Autonomous Agents

**Committee:** Dr. Ayanna Howard (Advisor), Dr. Charles Isbell, Dr. Sonia Chernova, Dr. Jason Borenstein, Dr. Tom Williams

### University of South Carolina (UofSC), Columbia, SC

August 2013 – May 2017

Bachelor of Science in Computer Science, Minor: Mathematics

Summa Cum Laude, Leadership Distinction in Research

## Experience

### Amazon Lab126

September 2024 – Present

Postdoctoral Scientist

Sunnyvale, CA

- Mine and analyze large datasets to leverage machine learning models and advanced statistical techniques to extract valuable insights from data.
- Tackle data scarcity challenges by developing innovative approaches to maximize the utility of available data sources.
- Produce written scientific reports and manuscripts for various publication opportunities.

### Human-Automation Systems (HumAnS) Lab

August 2017 – August 2024

Graduate Researcher

Atlanta, GA

**Projects:** Robot-Assisted Rehabilitation Therapy for Children with Motor Impairments, Bias-Aware Expression Recognition in Children

- Collaborated with Dr. Chen's rehabilitation therapy lab at Georgia State to develop and iterate robot-assisted therapy activities for children with motor impairments, with the goal of addressing the demand for rehab therapy in the Atlanta area
- Partnered with academics from public policy, psychology, and cognitive science to design, conduct, and document studies addressing ethical considerations in AI and robotics research, ensuring robust methodologies and multi-disciplinary analysis.
- Designed and conducted HRI user studies to evaluate research questions related to user performance, engagement, and trust in intelligent systems
- Analyzed machine learning datasets, models, and performance using state-of-the-art and novel auditing techniques and statistical measures
- Developed customized and tailored interactive behaviors for humanoid robots NAO and Pepper to engage directly with human interactants

### Amazon Lab126

June – Sept. 2022, June – Sept. 2023

Research Scientist Intern

(Remote) Atlanta, GA

- Collected, quantified, and modelled human perceptions of robot position appropriateness in home environments for HRI scenarios
- Established protocols to efficiently incorporate and compare diverse user preferences for evaluating Amazon's new household robot, Astro, specifically focusing on its intelligent motion Hangout behavior
- Utilized AWS cloud-based services for data-driven tasks and applications: S3, SageMaker, Thundra, and Rekognition
- Created and modified production-level code bases and code reviews
- Contributed to writing and presenting a first-author conference paper on internship project outcomes (2023 – ROMAN)

### Amazon Web Services (AWS) AI Labs

June – Aug. 2020, June – Sept. 2021

Research Scientist Intern (Rekognition & Video - 2020, Themis - 2021)

(Remote) Atlanta, GA

- Collaborated with research scientists, engineers, psychologists, and ethicists to design auditing software for AI models with multi-dimensional output, improving model evaluation protocols and product performance
- Investigated bias and fairness research questions in multi-class AI prediction systems, particularly facial expression detection
- Designed, conducted, and evaluated experiments to measure and model the perception of facial expressions using crowdsourcing techniques
- Contributed to writing and presenting a first-author conference paper on internship project outcomes (2022 – CVPR)

### Juni Learning

June 2019 – May 2021

Part-Time Computer Science Instructor (Scratch I & II, Python I & II, Java I & II)

(Remote) Atlanta, GA

- Taught weekly online coding classes to students aged 6 - 18, enhancing their content comprehension and skill-transfer
- Designed tailored sessions, curriculum assessment, and homework assignments to maximize learning outcomes
- Nurtured stronger communication and teaching skills through direct interactions with students and parents

**Adobe Systems, Inc.***GEM Experience Research Design Intern***May 2017 – August 2017***San Francisco, CA*

- Conducted ethnographic research studies with children to inform the design of a creative gaming prototype for classroom settings
- Investigated research questions targeting youth perceptions of design and creativity through gamification
- Presented transferrable research insights to Design, Technical, and Product teams, demonstrating the ability to communicate findings to diverse audiences.

**UofSC College of Engineering & Computing***Algorithmic Design (I & II) Lab Teaching Assistant (TA)***August 2016 – May 2017***Columbia, SC*

- Prepared and instructed four sessions of lab for CSCE 145 and CSCE 146 each week (Java I & II)
- Assisted students with assignments by responding to questions and guiding thought processes via e-mail and during lab sessions

**Assistive Robotics and Technology Lab***Undergraduate Research Assistant***August 2014 – May 2017***Columbia, SC***Projects:** *Ms. An: The Robot Tutor, Robot Assisted Music Therapy, Increasing CS Engagement via Robot Hip-Hop Dance*

- Conducted data collection & analysis in various studies by preparing study materials and running statistical analyses
- Programmed NAO robot for research studies and various outreach activities using Choregraphe and Python libraries
- Developed an online gamified learning experience for students in under-resourced SC middle schools

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**Skills****Programming/Scripting Languages:** (Proficient) Python, Java, HTML/CSS; (Familiar) C/C++, SQL, R, SPSS**Tools:** Git, LaTeX, Choregraphe (NAO & Pepper robots), Eclipse, AWS Cloud Services (S3, SageMaker), Jupyter, Photoshop**Libraries:** Pandas, Numpy, Scikit-Learn, Keras, TensorFlow, Matplotlib, Seaborn, Statsmodel**Research Methodologies:** experimental design, data collection, data analysis, data visualization, technical writing

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**Professional Development****Publications:**

**Bryant, D.,** Etienne, T., Howard, A., Smart, W.D., and Glas, D. (2023) Teaching a robot where to park: A scalable crowdsourcing approach. In *The 30th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN '23)*.

**Bryant, D.,** Deng, S., Sephus, N., Xia, W. and Perona, P. (2022). Multi-Dimensional, Nuanced and Subjective – Measuring the Perception of Facial Expressions. In *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR '22)*.

**Bryant, D.,** Xu, J., Rogers, K., and Howard, A. (2021). The Effect of Conceptual Embodiment on Human-Robot Trust During a Youth Emotion Classification Task. In *Proceedings of the 2021 IEEE International Conference on Advanced Robotics and its Social Impacts (ARSO '21)*. \*2021 Best Paper Award Recipient\*

Kim, E., **Bryant, D.,** Srikanth, D., and Howard, A. (2021). Age Bias in Emotion Detection: An Analysis of Facial Emotion Recognition Performance on Young, Middle-Aged, and Older Adults. In *Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society (AIES '21)*.

**Bryant, D.,** Borenstein, J. and Howard, A. (2020). Why Should We Gender? The Effect of Robot Gendering and Occupational Stereotypes on Human Trust and Perceived Competency. In *Proceedings of the 2020 ACM/IEEE International Conference on Human-Robot Interaction (HRI '20)*.

Rogers, K., **Bryant, D.,** and Howard, A. (2020). Robot Gendering: Influences on Trust, Occupational Competency, and Preference of Robot Over Human. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20 extended abstract)*.

**Bryant, D.,** Xu, J., Chen, Y. P., & Howard, A. (2019). The Effect of Robot vs. Human Corrective Feedback on Children's Intrinsic Motivation. In *Proceedings of the Companion of the 2019 ACM/IEEE International Conference on Human-Robot Interaction (HRI '21 LBR)*.

**Bryant, D.** and Howard, A. (2019). A Comparative Analysis of Emotion-Detecting AI Systems with Respect to Algorithm Performance and Dataset Diversity. In *AAAI/ACM Conference on AI, Ethics, and Society (AIES'19)*.

Xu, J., **Bryant, D.,** & Howard, A. (2018). Would You Trust a Robot Therapist? Validating the Equivalency of Trust in Human-Robot Healthcare Scenarios. In *The 27th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN '18)*.

Ogunyale, T., **Bryant, D.,** & Howard, A. (2018). Does Removing Stereotype Priming Remove Bias? A Pilot Human-Robot Interaction Study. In *Proceedings of the 2018 International Workshop on Fairness, Accountability, and Transparency in Machine Learning (FAT-ML '18)*.

Xu, J., **Bryant, D.,** Chen, Y. P., & Howard, A. (2018). Robot therapist versus human therapist: Evaluating the effect of corrective feedback on human motor performance. In *Proceedings of the 2018 IEEE International Symposium on Medical Robotics (ISMR '18)*.

**Bryant, D.,** Boyd, J., Harris, J., Smith, M., Garcia-Vergara, S., Chen, Y., & Howard, A. (2017). An Infant Smart-Mobile System to Encourage Kicking Movements in Infants At-Risk of Cerebral Palsy. In *Proceedings of the 2017 IEEE International Workshop on Advanced Robotics and its Social Impacts (ARSO '17)*.

**Bryant, D.,** Liles, K. R., & Beer, J. M. (2017). Developing a Robot Hip-Hop Dance Game to Engage Rural Minorities in Computer Science. In *Proceedings of the Companion of the 2017 ACM/IEEE International Conference on Human-Robot Interaction (HRI '17 LBR)*.

Liles, K. R., **Bryant, D.,** & Beer, J. M. (2017). How Can Social Robots Motivate Students to Practice Math? In *Proceedings of the Companion of the 2017 ACM/IEEE International Conference on Human-Robot Interaction (HRI '17 LBR)*.

### Invited Talks:

2024 Amazon Lab126 Consumer Robotics Research Symposium: Bias-Aware Algorithmic Design for HRI – Sunnyvale, CA	Speaker
2023 Georgia Tech Advisory Board Meeting 3-Minute Thesis – Atlanta, GA	Speaker
2022 Michigan Robotics Seminar: Facial Expression Detection for Adaptive Social Robots – Virtual	Speaker
2022 Cornell Robotics Seminar: Designing Social Robots for Applications Involving Children – Virtual	Speaker
2021 Wolfson College Science Society: Designing Emotionally Intelligent Social Robots – Virtual	Speaker
2020 Mines Interactive Robotics Research Summer Speaker Series: Social Robots & Artificial Emotional Intelligence – Virtual	Speaker
2019 Capital One Humanity AI Fall Conference: Designing Emotionally Intelligent Social Robots for Children – Mclean, VA	Speaker
2019 ACM SIGGRAPH Diversity & Inclusion Summit: Can AI Be Ethical? – Long Beach, CA	Panel Participant
2019 Silicon Flatirons Discussion on Explainable Artificial Intelligence: A Way Forward – Boulder, CO	Panel Participant
2018 TEDx Georgia Tech Student Speaker Salon: Paying it Forward with Social Robots – Atlanta, GA	Speaker

### Graduate Teaching Assistantships:

Introduction to Cognitive Science (CS 3790), Lead: Dr. Keith McGreggor – Fall 2023	Teaching Assistant
AI, Ethics, & Society (CS 4803/8803), Lead: Dr. Ayanna Howard – Spring 2020	Head Teaching Assistant

### Highlighted Service & Outreach:

2024 Georgia Tech Challenge Summer Program Industry Day: Amazon Lab126 – Atlanta, GA	Speaker & Demo Assistant
2024 Future Successors College & Career Expo: Career Opportunities in STEM & AI – Atlanta, GA	Workshop Organizer & Speaker
2023/2024 BDPA National Conference Robotic Arm Competition – Atlanta, GA	Competition Judge
2021/2022 AAI Undergrad Consortium Graduate Panel: What is Grad School Really Like? – Virtual	Panel Participant
2020 SEMLink Teen Science Workshop: Social Robots Meet Social Good – Virtual	Speaker
2020 Target TWIST Prepare to Launch: Meaningful Relationships, Lessons from the Tech World – Virtual	Speaker
2019/2021 Georgia Power Artificial Intelligence & Energy Awareness Day (ATL high school students)	Workshop Organizer & Keynote Speaker

### Achievements

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Herbert P. Haley Fellowship Recipient	June 2022
Georgia Tech Focus Fellowship & Women of Color Initiative (WOCI) Spotlight Recipient	February 2021
Georgia Tech SLOAN Fellowship Recipient	September 2019
GEM Consortium Annual Conference Technical Presentation Competition 1 <sup>st</sup> Runner Up	September 2019
Aspen Institute Roundtable on Artificial Intelligence 2019 Guest Scholar	January 2019
National Science Foundation GRFP Fellowship Recipient	March 2017
National GEM Consortium Fellowship Recipient	March 2017