Safinah Ali

PhD Student - Personal Robots Group, MIT Media Lab

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EDUCATION

Doctorate in Media Arts and Sciences   2019 - 2023 (expected)
Massachusetts Institute of Technology

Master's in Media Arts and Sciences   2017 - 2019
Massachusetts Institute of Technology

Master's in Human Computer Interaction   2015 - 2016
Carnegie Mellon University

Bachelor's in Design   2011 - 2015
Indian Institute of Technology Guwahati

RESEARCH INTERESTS

Human Robot Interaction, CS & AI Education, Interaction Design, Learning Games

RESEARCH PROJECTS

Creative AI Education for Middle Schoolers   *2020*
Mentor: C. Breazeal, I. Lee
Designed a middle school AI curriculum focusing on Creative Machine Learning techniques such as GANs. Deployed the curriculum using synchronous online learning with 70 middle school students during Summer 2020. Developed web-based teaching tools, online activities and assessment tools. Currently assessing learning gains and training school teachers to teach our curricula.

Designing Child Robot Interaction for Fostering Creativity (**MS Thesis**)   *2018 - 2019*
Mentor: C. Breazeal. Readers: M. Resnick, S. Osterweil, R. Picard
Designed novel child robot interactions for collaborative problem solving in AI with the goal of fostering creativity in children. Developed a novel architecture for artificial creativity, and scaffolding for creative thinking through game decisions, and verbal and non-verbal behaviors. Evaluated the effect of the robot companion's behavior on children's creative problem solving.

Long Term Child Robot Interaction to Foster Curiosity & Growth Mindset   *2018*
Mentors: H. Park, C. Breazeal
Developed and evaluated a novel expressive cognitive-affective architecture that synergistically integrated models of curiosity, understanding of mindsets, and expressive social behaviors. Developed algorithms for artificial curiosity, artificial mindset, and the verbal and non-verbal expressiveness in a social robot companion for children. Conducted a longitudinal study to evaluate the robot's ability to sustain engagement and promote children's curiosity and growth mindset.

Curiosity Assessment during Child Robot Interaction   *Fall 2017*
Mentors: C. Breazeal, R. Picard
Used game design and human robot interaction design principles to elicit curiosity in children while they play the learning game iSpy, with a curious robot Tega. Studied children's affects during high

curiosity / uncertainty states. Used correlation analysis of affect and curiosity states to model children's curiosity and build a real time curiosity sensing model during child robot interaction.

Robotic Alternative Augmentative Communication tools for Autism   *Spring & Summer 2018*
Mentor: C. Breazeal, R. Picard
Designed and evaluated a communication tool that makes use of the social robot Jibo's speech and expressivity to help children with ASD with social and emotional communication. Designed and validated alternate modes of emotional self report for children with ASD.

Sensing curiosity in play   *August 2015 - March 2017*
Mentors: J. Hammer, G. Kauffman, A. To
Identified models, varieties, antecedents, and consequences of curiosity. Reviewed how each type of curiosity can be manifested during play. Participated in ideating for, prototyping, and playtesting games to encourage STEM comfort and engagement through increased curiosity.

Sonify, making visual graphs accessible   *Spring & Summer 2016*
Mentors: B. John, R. Ram, D. Gulley, K. Berntsen, G. Minnaret. Sponsor: Bloomberg
Conducted contextual research in computer accessibility to identify challenges faced by desktop users with disabilities. Prototyped solutions to make visually complex content more accessible to people with vision impairments. Developed and evaluated the technology and interactions for Sonify, an audio and tactile interface to make data visualization accessible.

Studying the role of guilt in Human Robot Interaction   *Spring 2016*
Mentor: I. Nourbakhsh
Designed and ran an experiment to study how human involvement in the malfunctioning of a robot affects their pro-activeness in fixing it. Prototyped a robot that interacted with humans to stop functioning under different circumstances, varying human responsibility and guilt. Collected data through sensing, observation and post-test surveys. Analyzed data and reported findings.

RobotTutor, an open source tablet based learning tool   *Fall 2015*
Mentor: J. Mostow
Designed the Arithmetic module of the RoboTutor project that is now a finalist in Global Learning XPRIZE competition (winning $1 million). The nodule aims to teach single-digit addition and subtraction to elementary school children.

Designing wearable devices for pre-diabetic patients   *2014 - 2015*
Mentor: K. Sorathia. Sponsor: Nokia Research
Designed a wearable tool that uses intrinsic motivation and goal setting to persuade pre-diabetic patients to follow lifestyle prescriptions. Deployed an Android Wear compatible health monitoring application for pre-diabetic patients that visualizes real-time physical activity, temperature and stress levels. Evaluated the application with 21 pre-diabetic patients.12% avg. increase in rate of activity.

Designing gestural interactions to enhance smartphone accessibility   *2013*
Mentor: K. Sorathia. Sponsor: Samsung Research
Conducted research on existing tools and gaps in mobile accessibility. Designed and implemented 9 gestural interactions aimed at improving accessibility of Samsung smartphones.

WORK EXPERIENCE

Research Assistant, Personal Robots, MIT Media Lab   *August 2017 - current*
Developing digital learning techniques for children leveraging AI and Human Robot Interaction. Fostering positive learning behaviors in AI education using Child Robot Interaction.

User Experience Designer, vArmour   *March 2017 - August 2017*
Designed the User Experience of several vertical products delivering data center and cloud security through micro-segmentation. Designed and developed data visualizations and GUIs.

Research Associate, Carnegie Mellon University   *September 2016 - March 2017*
Designed Audience Participation Games on Twitch. Formed audience participation research questions and conducted user research. Designed surveys and interviews, logged data from games, and managed and processed data in R.

User Experience Designer (Intern), Amazon   *Summer 2014*
Designed the User Experience of a desktop based Kindle authoring tool for creating, editing, and enriching Kindle content. Conducted usability evaluation of existing authoring tools. Conducted 6 contextual interviews, developed user personas, scenarios, and user journeys.

Design Lead, Techniche   *2013 - 2014*
Led the branding and overall design requirements of Techniche 2014, the annual techno-management festival of IIT Guwahati that observed a participation of 30,000 students. Led a team of 67 designers, event managers, and marketing executives.

User Experience Designer (Intern), Fractal Ink Design Studio — *Summer 2013*
Designed the User Experience of Samsung Club - a series of 6 native mobile apps. Designed the interface for three Windows 8, and one Android application for mobile and tablet for clients including ICICI, Hungama TV, TCS, and Tenlegs.

PUBLICATIONS

Ali S., Park H., Breazeal C. (2020). Can Children Emulate a Robotic Non-Player Character's Expressed Creativity in a Collaborative Drawing Game? To appear in the *Proceedings for CHI Play 2020.*

Saldias B., **Ali S.** (2020). Towards Child-Aware Machine Learning with a Focus on NLP Challenges and Applications. Women in Machine Learning Workshop. *Thirty-seventh International Conference on Machine Learning 2020.*

Ali S., DiPaola D., Lee I., Jackson D., Kiel J., Beal K., Zhang H., Cheng Y. and Breazeal C. (2020). Adapting K-12 AI Learning for Online Instruction. 2nd International Workshop on Education in Artificial Intelligence K-12 (EduAI '20). In Proceedings of *German Journal of Artificial Intelligence 2/2021*

Ali S., Muralidharan L., Alfieri F., Agrawal M., Jorgensen J. (2019) Sonify: Making Visual Graphs Accessible. In: Ahram T., Taiar R., Colson S., Choplin A. (eds) *Human Interaction and Emerging Technologies. IHIET 2019.* Advances in Intelligent Systems and Computing, vol 1018. Springer, Cham

Ali, S., Williams, R., Payne B., Park H., Breazeal C. (2019) Constructionism, Ethics, and Creativity: Developing Primary and Middle School Artificial Intelligence. In Proceedings of *IJCAI 2019.*

Ali, S., Moroso, T., Breazeal, C. (2019). Can Children Learn Creativity from a Social Robot? In *Proceedings of ACM Creativity and Cognition 2019.*

Ali, S., Moroso, T. (2019). Leveraging Social Robots as a Creativity Support Tool for Young Children. Poster. *Computer Science and Learning Science Symposium 2019.*

Holmes, J., To, A., Zhang, F., **Ali, S.,** Bai, Z., ... & Hammer, J.. (2019). A Good Scare: Leveraging Game Theming and Narrative to Impact Player Experience. In *Proceedings of CHI 2019.*

Spaulding, S., Chen, H., **Ali, S.**, Kulinski, M., & Breazeal, C. (2018, July). A Social Robot System for Modeling Children's Word Pronunciation: Socially Interactive Agents Track. In *Proceedings of the 17th International Conference on Autonomous Agents and MultiAgent Systems* (pp. 1658-1666). International Foundation for Autonomous Agents and Multiagent Systems.

To, A., **Ali, S.**, Kaufman, G. Hammer, J. (2018). Integrating Curiosity and Uncertainty in Game Design. The New Science of Curiosity (pp. 169-203). New York, NY: Nova Science Publishers, Inc.

Ali, S., Breazeal, C. (2018). The Use of Social Robots for Social Emotional Communication within Families with Autism Spectrum Disorder *Play Make Learn*

Ali, S., To, A., Fath, E., Bai, Z., ... & Kaufman, G. (2018). Transition from Game Driven Goal Delineation to Goal Driven Game Design in Tandem Transformational Game Design *Proceedings of the International Academic Conference on Meaningful Play.*

Ali, S., Moeller, R., Choi, J., Hammer, J. (2017) Analytic Frameworks for Audience Participation Games and Tools - *Spectating Play 2017*

To, A., Fath, E., Zhang, E., **Ali, S.**, Kildunne, C., Fan, A., ... & Kaufman, G. (2016). Tandem Transformational Game Design: A Game Design Process Case Study - *Proceedings of the International Academic Conference on Meaningful Play.*

To, A., **Ali, S.**, Kaufman, G., & Hammer, J. (2016). Integrating Curiosity and Uncertainty in Game Design. *DiGRA/FDG '16 - Proceedings of the First International Joint Conference of DiGRA and FDG.*

To, A., Fath, E., Zhang, E., **Ali, S.**, Kildunne, C., Fan, A., Hammer, J., Kaufman, G. (2016). Tandem Transformational Game Design: A Game Design Process Case Study. *Meaningful Play 2016.*

Agarwal, B., Goel, V., **Ali, S**., Talukdar, N., & Sorathia, K. (2014, December). CaptuRing: A Tangible Imaging Tool for Brainstorming. *Proceedings of the India HCI 2014 Conference on Human Computer Interaction (p. 132). ACM.*

Ali, S., Bahuguna, B. (2016, July). Guilt, Robots, and Interaction Design. *Article*

Ali, S. (2016, June). The Suggested Web is Killing Discovery. *Article*.

AWARDS

- Diversity, Equity, & Inclusion (DEI) fellow, MIT, 2020-2021
- Winner, City Robotics Hackathon, MIT Media Lab, 2018
- *Outbreak* - Best Student Non-Digital Game People's Choice Award. Meaningful Play 2016
- TCS 100 Award, Best outgoing student of the institute, IIT Guwahati — 2015
- Kyoorius Student Design Award, Typography — 2014
- Inter-IIT Basketball league - *Silver* 2012 & *Bronze* 2014
- Certificate of Merit for Academic Excellence, BVM, Nagpur — 2009
- Scholarship for Meritorious Performance, Maharashtra Talent Search Examination — 2008

TEACHING, MENTORING & TALKS

- Instructor, Amazon Future Engineers, Creative AI Camp, Summer 2020.
- Instructor, College Bound AI Camp, Remote Instruction, Summer 2020.
- Instructor, Steam Ahead AI Camp, Remote Instruction, Summer 2020.
- Mentor, CovEd program for k-12 students from low income communities, Summer & Fall 2020.
- Instructor, RASP AI Camp, Remote Instruction, Summer 2020.
- Speaker, Interaction Design Conference 2020, Milan, Italy, 2020.
- Mentor and Organizer, MIT India Initiative, Mumbai, India, 2020 edition.
- Mentor, Clubes de Ciencia Mèxico, Guadalajara, Mexico, 2019 edition.
- Red Judge for IBM AI Xprize Competition, 2019.
- Mentor, SheHacks Boston, 2019.
- Mentor, MIT UROP program. (Mentees: N. Devasia, T. Morosa, V. Sindato, M. Alalawi)
- Speaker, Education Technology in Frontier Markets, 2018.
- Mentor, Clubes de Ciencia Mèxico, in Chihuahua, 2018 edition.
- Mentor, SheHacks Boston, 2018.
- Digital design workshop at Human Computer Interaction Institute, Carnegie Mellon University.
- Student volunteer, Interaction Design Education Summit 2016, Helsinki, Finland.
- Teacher, English & Math for 7-12 graders in Nagpur, India as a part of Millat Education Trust, USA.
- Teacher, English for middle school female students at Shishugram orphanage home, Guwahati, India.