Safinah Ali

PhD Student - Personal Robots Group, MIT Media Lab
safinah@mit.edu | 412.313.1433 | safinahali.github.io

EDUCATION

Doctorate in Media Arts and Sciences   2019 - ongoing
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, Co-creative agents, Creative ML, CS & AI Education, Interaction Design, Learning Games

RESEARCH PROJECTS

Designing Child Robot Interaction for Fostering Creativity   *2018 - 2022*
Mentor: C. Breazeal.
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. Currently designing collaborative creative child-robot storytelling experiences.

Creative AI Education for Middle Schoolers   *2020 - 2022*
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 119 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 curriculum.

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. Developed and evaluated Sonify, an audio and tactile interface to make visually complex data visualization accessible to people with visual impairments.

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 Intern, Facebook AI Research (FAIR)   *Summer 2021*
Designed collaborative human-AI doodling interactions and developing collaborative techniques that foster creativity in humans. Evaluating human-AI interactions in collaborative drawing tasks through user studies.

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 mobile and tablet for clients including ICICI, Hungama TV, TCS, and Tenlegs.

PUBLICATIONS
FULL PAPERS

Ali, S., Breazeal, C. (2023). AI-Audit. A Card Game to Reflect on Everyday AI Systems. In the
Thirteenth AAAI Symposium on Educational Advances in Artificial Intelligence (EAAI-23)

DiPaola, D., Moore, K., **Ali, S.,** Perret, B., Zhou, X., Zhang, H., & Lee, I. (Forthcoming). Make-a-
thon for Middle School AI Educators. To appear in *SIGCSE 2023*.

Morales-Navarro, L., Kafai, Y., Castro, F., Payne, W., Desportes, K., DiPaola, D., Williams, R., **Ali,
S.,** et al. Making Sense of Machine Learning: Integrating Youth's Conceptual, Creative, and Critical
Understandings of AI. Submitted to *International Society of the Learning Sciences 2023*.

Williams, R., **Ali, S.,** Devasia, N., DiPaola, D., ... & Breazeal, C. (2022). AI+ ethics curricula for
middle school youth: Lessons learned from three project-based curricula. *International Journal of
Artificial Intelligence in Education, 1-59.*

Zhang, H., Lee, I., **Ali, S.,** DiPaola, D., Cheng, Y., & Breazeal, C. (2022). Integrating ethics and
career futures with technical learning to promote AI literacy for middle school students: An
exploratory study. *International Journal of Artificial Intelligence in Education, 1-35.*

Walsh, B., **Ali, S.,** Castro, F., Desportes, K., DiPaola, D., Lee, I., ... & Zhang, H. (2022, March). Making Art with and about Artificial Intelligence: Three Approaches to Teaching AI and AI Ethics to Middle and High School Students. In *Proceedings of the 53rd ACM Technical Symposium on Computer Science Education V. 2 (pp. 1203-1203).*

Lyu, Z., **Ali, S.,** & Breazeal, C. (2022). Introducing Variational Autoencoders to High School Students. In the *Twelfth AAAI Symposium on Educational Advances in Artificial Intelligence (EAAI-22)*

Ali, S., Devasia, N. E., & Breazeal, C. (2022, June). Escape! bot: Social robots as creative problem-solving partners. In *Creativity and Cognition (pp. 275-283).*

Ali, S., Park, H. W., & Breazeal, C. (2021). A social robot's influence on children's figural creativity during gameplay. *International Journal of Child-Computer Interaction, 28, 100234.*

Ali, S., Devasia, N., Park, H. W., & Breazeal, C. (2021). Social Robots as Creativity Eliciting Agents. To appear in *Frontiers in Robotics and AI.*

Rosenberg, M., Park, H. W., Rosenberg-Kima, R., **Ali, S.,** Ostrowski, A. K., Breazeal, C., & Gordon, G. (2021). Expressive Cognitive Architecture for a Curious Social Robot. *ACM Transactions on Interactive Intelligent Systems (TiiS), 11(2), 1-25.*

Ali, S., Park, H. W., & Breazeal, C. (2020, November). Can Children Emulate a Robotic Non-Player Character's Figural Creativity?. In *Proceedings of the Annual Symposium on Computer-Human Interaction in Play (pp. 499-509).*

Ali, S., DiPaola, D., Lee, I., Hong, J., & Breazeal, C. (2021, May). Exploring Generative Models with Middle School Students. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (pp. 1-13).*

Lee, I., **Ali, S.**, Zhang, H., DiPaola, D., Breazeal, C. (2020). Developing Middle School Students' AI Literacy. In *Proceedings of the 52nd ACM technical symposium on computer science education (SIGCSE).*

Ali, S., DiPaola, D., Breazeal, C. (2020). What are GANs?: Introducing Generative Adversarial Networks to Middle School Students. In the *Eleventh AAAI Symposium on Educational Advances in Artificial Intelligence (EAAI-21)*

Ali, S., Lee, I. (2020). The Contour to Classification Game: An Introduction to Neural Networks. In the *Eleventh AAAI Symposium on Educational Advances in Artificial Intelligence (EAAI-21)*

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*

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., 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.*

SHORT PAPERS & POSTERS

Ali, S., Upadhyay, S., Hiranandani, G., Glassman, E. L., & Koyejo, O. (2022). Metric Elicitation; Moving from Theory to Practice. In *Workshop on Human-Centered AI Workshop at NeurIPS 2022.*

Ali, S., Devasia, N., & Breazeal, C. (2021). Designing Games for Enabling Co-creation with Social Agents. In *workshop on Designing Games for and with Children at Interaction Design for Children (IDC) 2021.*

DiPaola, D., **Ali, S.,** Hong, J., Zhang, H., Breazeal, C., Lee, I. Youth as Investigators of Bias in Artificial Intelligence. In *American Educational Research Association 2021.*

Ali, S., & Parikh, D. (2021). Telling creative stories using generative visual aids. *In Workshop on Machine Learning for Creativity and Design, NeurIPS 2021.*

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 (ICML) 2020*

Devasia, N., **Ali, S.,** & Breazeal, C. (2020, November). Escape! Bot: Child-Robot Interaction to Promote Creative Expression During Gameplay. In Extended Abstracts of the 2020 *Annual Symposium on Computer-Human Interaction in Play (pp. 219-223).*

Ali S., Park H., Breazeal C. (2020). Influence of a Social Robot's Co-presence on Children's Figural Creativity. Workshop on Exploring Creative Content in Social Robotics. *ACM/IEEE International Conference on Human-Robot Interaction 2020*

Ali S., Park H., Breazeal C. (2020). Drawing with Jibo: Influence of a Social Robot's co-presence on Children's Creativity. Workshop on Creativity and Robotics. *International Conference on Social Robotics*

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

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

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

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

AWARDS
- Microsoft Research Fellow, 2022-2024
- Diversity, Equity, & Inclusion (DEI) fellow, MIT, 2020-2023
- Scholarship to attend EAAI, 2022.
- 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

INVITED TALKS & PRESENTATIONS
- Designers' Roles in Dystopian Futures, Interaction 2023, Zurich, Switzerland, 2023.
- Art & AI. Winchester High School, 2022.
- Future Maker Speaker Series, 2022.
- Creative human-AI interaction and k12 AI literacy. Everyday AI event, Cornell Tech, 2022.
- Design Process for Developing Creativity Support Tools, IDEO, 2022.
- Illinois Statewide K-12 CS Education Summit, University of Illinois 2021.
- Child-robot interaction for creative learning. Brown University, 2021.
- Microsoft Research Fellowship Symposium, 2021.
- Women in Machine Learning Young Scientist Feature, 2021.
- Child-robot Interaction for Creative Learning, STEM week, Mexico, 2021.
- Creative AI Education. Day of AI, Massachusetts STEM week, 2021.
- Developing AI Literacy in Middle School Students. International Society for Technology in Education (ISTE), 2021.

- Interweaving Ethics in AI Education. Computer Science Teachers Association (CSTA), 2021.
- Creative AI Literacy. The Scheller Science and Engineering Program for Teachers, Education Arcade, 2020.
- Developing Middle School AI Literacy. Teacher with GUTS, 2020.
- Creative Robots Inspiring Creativity. Interaction 2020, Milan, Italy, 2020.
- Introduction to AI Concepts. BU Tech + Law Clinic Seminar, 2020.
- Co-creative robotic agents. Design talks at Sprinklr, 2020.
- Personal Robots. Science Carnival Cambridge 2018 & 2019.
- AI + Ethics in the Classroom. Jameel World Education Lab (J-WEL). Cambridge, 2019.
- Robotic toolkits for creative learning. Tech Together (SheHacks Boston) 2018.
- Robots for Education. Emerging Education Technology in Frontier Markets, The Legatum Center, 2018.
- Social Robots for Education. Department of Design, Alumni Talks. 2017.
- Digital design workshop at HCII, Carnegie Mellon University, 2016.

TEACHING & MENTORING
- Instructor, MAS Special Topic, Introduction to Text-to-Image Generation for K-12 Education MIT, IAP 2023
- Instructor, MAS.S65 Designing Learning Technology for Children, MIT, Spring 2022.
- Instructor & head mentor, SureStart VAIL program, 2021.
- Instructor and coordinator, Future Makers Program for Middle Schoolers, MIT, Summer 2020.
- 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.
- 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: Z. Lyu, N. Devasia, T. Morosa, V. Sindato, M. Alalawi)
- Mentor, Clubes de Ciencia Mèxico, in Chihuahua, 2018 edition.
- Mentor, SheHacks Boston, 2018.
- 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.
- Teacher, English for middle school female students at Shishugram orphanage, Guwahati, India.

SERVICE
- Program Committee, ICLS/CSCL 2023
- Program Committee Member, DIS 2023
- Program Committee Member, Creativity & Cognition 2022, 2023
- Reviews, Creativity & Cognition 2022
- Reviewer, Transactions in HRI 2022, 2023
- Reviewer, CHI 2020, 2021, 2022, 2023
- Reviewer, IDC 2019, 2020, 2021, 2023
- Reviewer, DIS, 2021
- Reviewer, Frontiers in Robotics and AI, 2020, 2021, 2022

- Reviewer, HRI, 2020, 2021
- Review, Interaction Studies, 2021
- Student volunteer, Interaction 2016
- Student volunteer, Midwest UX 2016