Arijit Ray

✉ array@bu.edu
🌐 https://cs-people.bu.edu/array/

Goal

To train machines to see, understand language, act, and create.

Appointments

Fall'23	**Teaching Fellow**, Boston University *Designing and teaching graduate-level CS 541, Applied Machine Learning.*
Summer'23	**AI Resident**, Mineral, Alphabet (Google) X *Adapted multimodal language models for custom phrase localization - useful for detecting specific diseases on strawberries specified by language.*
Summer'22	**Research Scientist Intern**, Meta (Facebook) AI (FAIR) *With Ranjay Krishna, Filip Radenovic, Abhimanyu Dubey, Dhruv Mahajan. Developed a benchmark to explore design choices for compositional reasoning in vision-language models.*
Fall'21 - ?	**Research Fellow**, Boston University *Advised by Kate Saenko and Bryan Plummer. Partly funded by DARPA Semantic Forensics with University of California, Berkeley.*
2017 - 2021	**Computer Scientist**, SRI International *Developed vision-language models that can rationalize for DARPA Explainable AI Program.*
Summer'16	**Deep Learning Intern**, Blue River Technology *Developed weed detection - a key selling point leading to John Deere acquisition for $305M.*
2016 - 2017	**Graduate Research Assistant**, Virginia Tech *Improved robustness of models that can answer questions about images. Advised by Devi Parikh*

Education

2021 – ?	**Ph.D., Boston University**, Computer Science *Teaching machines to compositionally reason about vision, language, and action.* *Advised by Kate Saenko, Bryan Plummer, and Ranjay Krishna (University of Washington).*
2022 – 2023	**Visiting Student, MIT**, AIForImpact Venture Studio, Media Lab *Formulating how vision-language AI can impact various verticals.*
2015 – 2017	**M.S., Virginia Polytechnic Institute and State University**, Computer Engineering Thesis: *Developing models that can converse with humans, advised by Devi Parikh.*
2011 – 2015	**B.Tech., SRM University, India**, Electrical Engineering *GPA: 9.05/10, First-Class Distinction. Received Academic Merit Scholarship.*

Research Publications

Peer-reviewed Conferences

1. **A. Ray**, F. Radenovic, A. Dubey, B. A. Plummer, R. Krishna, and K. Saenko, "Cola: How to adapt vision-language models to compose objects localized with attributes?" *Conference on Neural Information Processing Systems (NeurIPS)*, 2023.

2. R. Tan, **A. Ray**, A. Burns, B. A. Plummer, J. Salamon, O. Nieto, B. Russell, and K. Saenko, "Language-guided audio-visual source separation via trimodal consistency," *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, pp. 10 575–10 584, 2023.

3 K. Alipour, **A. Ray**, X. Lin, M. Cogswell, J. P. Schulze, Y. Yao, and G. T. Burachas, "Improving users' mental model with attention-directed counterfactual edits," *Applied AI Letters*, vol. 2, no. 4, e47, 2021.

4 **A. Ray**, M. Cogswell, X. Lin, K. Alipour, A. Divakaran, Y. Yao, and G. Burachas, "Generating and evaluating explanations of attended and error-inducing input regions for vqa models," *Applied AI Letters*, vol. 2, no. 4, e51, 2021.

5 K. Alipour, **A. Ray**, X. Lin, J. P. Schulze, Y. Yao, and G. T. Burachas, "The impact of explanations on ai competency prediction in vqa," *2020 IEEE International Conference on Humanized Computing and Communication with Artificial Intelligence (HCCAI)*, pp. 25–32, 2020.

6 **A. Ray**, K. Sikka, A. Divakaran, S. Lee, and G. Burachas, "Sunny and dark outside?! improving answer consistency in vqa through entailed question generation," *Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, pp. 5860–5865, 2019.

7 **A. Ray**, Y. Yao, R. Kumar, A. Divakaran, and G. Burachas, "Can you explain that? lucid explanations help human-ai collaborative image retrieval," *Proceedings of the AAAI Conference on Human Computation and Crowdsourcing*, vol. 7, no. 1, pp. 153–161, 2019.

8 **A. Ray**, G. Christie, M. Bansal, D. Batra, and D. Parikh, "Question relevance in vqa: Identifying non-visual and false-premise questions," *Proceedings of the 2019 Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2016.

Workshops

1 K. Deng, R. Tan, S. Gabriel, B. Plummer, K. Saenko, and **A. Ray**, *Socratis: Are large multimodal models emotionally aware?* ICCV Worskshop on Emotionally and Culturally Aware AI (Oral), 2023.

2 S. Ghosh, G. Burachas, **A. Ray**, and A. Ziskind, *Generating natural language explanations for visual question answering using scene graphs and visual attention*, IJCAI/ECAI Workshop on Explainable Artificial Intelligence, XAI 2018, 2018.

Patents

1 G. Burachas, **A. Ray**, and Y. Yao, *Attention-based explanations for artificial intelligence behavior*, US Patent 10,909,401, Feb. 2021.

2 A. Divakaran, K. Sikka, **A. Ray**, X. Lin, and Y. Yao, *User targeted content generation using multimodal embeddings*, US Patent App. 17/191,698, Sep. 2021.

Awards

2019 **Shark Tank Award**, SRI International, Center for Vision Technologies.
Received $50,000$ *for* 6 *months that supported my project on generating personalized content. Awarded to* 3 *projects in the center.*

2016 **Employee of the Fortnight**, Blue River Technology.
Only intern to win this award for developing a plant detection model in half the summer, a key selling point for the company.

2013 **Silver Medal**, Research Day, SRM University.
For designing a white paper on an exoskeleton suit. Rank 2 *out of ~*300 *students in the department.*

2012 **Academic Merit Scholarship**, SRM University.
Rank 3 *out of ~*300 *students in the Electrical Engineering Department.*

Mentoring

2023 – ?	Xavier Thomas (Boston University)
	Gitika Jha (Boston University)
	Jiayi Shen (Boston University)
	Katherine Deng (Boston University)
2022	Praneeth Chandra Bogineni (Boston University; now at a startup, Oplus.ai)
2018-2021	Kamran Alipour (University of California, San Diego; now Senior AI R&D Engineer, Williams Sonoma)
2019	Julia Kruk (SRI International; now MS student at Georgia Tech)

Leadership

Spring'23	**Student Leadership**, AI For Impact Venture Studio, MIT Media Lab
	Part of the student leadership council organizing networking events with over 100 attendees from 3 schools in the Boston area.
2021 – 2022	**Co-chair**, AI+X of BU and Harvard
	Started a graduate student workshop investigating how AI can impact contemporary research areas.
2021 – 2023	**Publicity Chair**, Boston University
2016 – 2017	**Vice President**, Tau Beta Pi Engineering Honor Society
	Vice President of the Virginia Tech Chapter

Professional Service

2016 – ?	**Reviewer**
	EMNLP'23, Neurips'23, Neurips'22, COLING'22, ACM Multimedia 2021, CVPR 2016.
2022, 2017	**Judge**, Blue Ridge Highlands Regional Science Fair
	Science fair for high-school students

Media

2019	**TechXplore, Phys.org**
	An image-guessing game to evaluate the helpfulness of machine explanations, presented also as a CVPR 2019 Demo and AAAI HCOMP 2019 Poster.
2014	**Indian Express, Deccan Chronicle, Engineering.Careers360**
	Designing an Unmanned Autonomous Drone for delivering help to disaster victims.

Early Achievements

2011	SRM-JEE Undergraduate Entrance Examination
	99%ile among students in India.
	All India Central Board Examinations
	Top Mathematics score: 97/100, 99%ile among students in India.
2007	National Science Olympiad
	All India Rank: 168, City Rank: 7. Maintained a national rank < 600 in National Science Olympiads 2008, 2009, 2010
2006	Founded middle-school science society
	Goal of encouraging middle-school students take an interest in science. Won accolades in multiple school/city-level exhibitions.