

Arijit Ray





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🌐 <https://cs-people.bu.edu/array/>

Appointments

- Fall'23  **Teaching Fellow**, Boston University
Designing and teaching CS 541, Applied Machine Learning.
- Summer'23  **AI Resident**, Mineral, Alphabet (Google) X
Adapted multimodal language models for personalized object localization.
- Summer'22  **Research Scientist Intern**, Meta (Facebook) AI (FAIR)
Developed a benchmark to explore design choices for compositional reasoning in large vision-language models.
- Fall'21 - ?  **Research Fellow**, Boston University
Partly funded by DARPA Semantic Forensics with University of California, Berkeley.
- 2017 - 2021  **Computer Scientist**, SRI International
Developed models that can rationalize for DARPA Explainable AI Program.
- Summer'16  **Deep Learning Intern**, Blue River Technology
Developed plant detection - a key selling point leading to John Deere acquisition for \$305M.
- 2016 - 2017  **Graduate Research Assistant**, Virginia Tech
Advised by Prof. 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 - ?  **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?" *in submission*, 2023.
- 2 R. Tan, **A. Ray**, A. Burns, *et al.*, "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, *et al.*, "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, *et al.*, "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 **A. Ray**, K. Deng, R. Tan, S. Gabriel, B. Plummer, and K. Saenko, *Socratis: Are large multimodal models emotionally aware?* ICCV Workshop on Emotionally and Culturally Aware AI, 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)
- 2020–2021  Kamran Alipour (University of California, San Diego; now at 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 brainstorming events with over 100 attendees from 3 schools in the Boston area.
- 2021 – 2022  **Co-founder**, AI+X of BU and Harvard
Graduate student workshop investigating how AI can address pressing challenges in 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 as a CVPR 2019 Demo and HCOMP 2019 Poster.
- 2014  **Indian Express, Deccan Chronicle, Engineering.Careers360**
Designing an Unmanned Autonomous Drone for delivering help to disaster victims

Early Achievements

- 2011  All India Central Board Examinations, Top math score
97/100, Top <0.1% (99.9%ile) students in India
- 2007  National Science Olympiad
All India Rank: 168, City Rank: 7. Maintained a national rank < 1000 in National Science Olympiads 2008, 2009, 2010
- 2006  Founded Science Society, Middle School
Goal of encouraging middle-school students take an interest in science. Won accolades in multiple school/city level exhibitions.