Arijit Ray

arijit.ray93@gmail.com, https://arijitray1993.github.io/

Interests

Teaching computers how to see (vision), hear (audio), read (language), and think (machine/deep learning).

CODING SKILLS

Strong: Python, PyTorch, Keras, TensorFlow, Flask

Medium: HTML/CSS, JavaScript

Education

2021-Present **Ph.D., Computer Science** — **Boston University**
Concentration in Computer Vision, NLP, and Deep Learning
Advisor: Prof. Kate Saenko, Prof. Bryan Plummer.

2015-2017 **M.S., Computer Engineering** — **Virginia Polytechnic Institute and State University**
GPA: 3.96 / 4.00, *Concentration in Computer Vision and NLP*
Advisor: Prof. Devi Parikh.

2011–2015 **B.Tech., Electrical and Electronics Engineering** — **SRM University, India**
GPA: 9.05/10, *summa cum laude* (First-Class Distinction),
Received Academic Merit Scholarship, Advisor: Prof. N. Chellammal

Positions Held

Sep'21 - Present **Research Fellow**
Image and Video Computing Lab, Boston University

May'17 - June'21 **Computer Scientist**
Center for Vision Technologies, SRI International (formerly, Stanford Research Institute)

May'16 - Aug'16 **Deep Learning Intern**
Blue River Technology (now acquired by John Deere), Sunnyvale, CA

Apr'16 - May'17 **Graduate Research Assistant**
Prof. Devi Parikh, Computer Vision Lab, Virginia Tech

Summer 2014 **Undergraduate Research Intern**
Detecting Sarcasm for Sentiment Analysis using Intuitive Attributes, Prof. Elango Sivasankar, NIT Trichy

Summer 2012 **Undergraduate Research Intern**
Programming a PID controller for High Frequency RF Cavity in Cyclotrons, Variable Energy Cyclotron Center, Kolkata

Selected Awards

Spring 2019 **SRI CVT Shark Tank Award**
Won a competitive grant that supported my project on user-specific content generation in social media

Summer 2016 **Employee of the Fortnight**
Helped develop weed detection models @ Blue River Technology that contributed to acquisition by John Deere

Spring 2013 **Silver Medal, Research Day Award**
Presented white paper on electro-mechanical exoskeleton construction, SRM University

Fall 2012 **Academic Merit Scholarship**
SRM University, top 1% of students in department

Selected Publications

Kamran Alipour, Arijit Ray, Xiao Lin, Michael Cogswell, Jurgen Schulze, Yi Yao, Giedrius Burachas, "**Improving Users' Mental Model with Attention-directed Counterfactual Edits**", **Applied AI Letters 2021**, Wiley.

Arijit Ray, Michael Cogswell, Xiao Lin, Kamran Alipour, Ajay Divakaran, Yi Yao, Giedrius Burachas, "**Generating and Evaluating Explanations of Attended and Error-Inducing Input Regions for VQA Models**", **Applied AI Letters 2021**, Wiley.

Arijit Ray, Karan Sikka, Ajay Divakaran, Stefan Lee, Giedrius Burachas, "**Sunny and Dark Outside?! Improving Answer Consistency in VQA through Entailed Question Generation**", Conference on Empirical Methods in Natural Language Processing (**EMNLP 2019**), Hong Kong, also at VQA/Visual Dialog Workshop CVPR 2019 (**CVPR-W 2019**).

Arijit Ray, Yi Yao, Rakesh Kumar, Ajay Divakaran, Giedrius Burachas, "**Can You Explain That? Lucid Explanations Help Human-AI Collaborative Image Retrieval**", AAAI Conference on Human Computation and Crowdsourcing (**AAAI-HCOMP 2019**), Skamania Lodge, Washington, also as **CVPR 2019** Demo.

Arijit Ray, Giedrius T. Burachas, Karan Sikka, Anirban Roy, Avi Ziskind, Yi Yao, Ajay Divakaran, "**Make Up Your Mind: Towards Consistent Answer Predictions in VQA Models**", Shortcomings in Vision and Language Workshop, European Conference on Computer Vision (**ECCV-W 2018**), München, Germany

Shalini Ghosh, Giedrius Burachas, Arijit Ray, and Avi Ziskind, "**Generating Natural Language Explanations for Visual Question Answering using Scene Graphs and Visual Attention**", IJCAI/ECAI Workshop on Explainable Artificial Intelligence (**IJCAI-W 2018**), Stockholm, Sweden

Arijit Ray, "**The Art of Deep Connection - Towards Natural and Pragmatic Conversational Agent Interactions**", Master's Thesis, 2017, Virginia Tech, https://vtechworks.lib.vt.edu/handle/10919/78335

Arijit Ray, Gordon Christie, Mohit Bansal, Dhruv Batra, Devi Parikh, "**Question Relevance in VQA: Identifying Non-Visual and False-Premise Questions**", Conference on Empirical Methods in Natural Language Processing (**EMNLP 2016**), Austin, Texas.

Prashant Chandrasekar, Xuan Zhang, Saurabh Chakravarty, Arijit Ray, John Krulick, and Alla Rozovskaya, "**The Virginia Tech System at CoNLL-2016 Shared Task on Shallow Discourse Parsing**", (**ACL-CoNLL 2016**) p. 115.

Selected Projects

Sep'21 - Present **DARPA SemaFor - UC Berkeley/BU Team**
Generating evidence and detecting AI-generated media.

Mar'19 - Dec'19 **SRI CVT SharkTank - PERSUADE - Personalized User-specific Ad Enhancement**
Generating images that are more likely to persuade a user on a topic by leveraging their related interests. [Link] shorturl.at/oMOR8

Jun'17 - Jun'21 **DARPA Explainable AI (XAI) - SRI Team**
Improving the explainability and consistency of VQA models.

Spring 2013 **ABU Asia-Pacific ROBOCON - SRM University Team**
Developing high speed traction control for autonomous robots for a robotic competition

Press Coverage

Spring 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

Fall 2014 **Indian Express, Deccan Chronicle, Engineering.Careers360**
UAV with Facial Recognition Capabilities for SOS Help and Surveillance

Miscellanea

Selected Talks:

April 2021 — **DARPA XAI PI Meeting**
Presented our work on Error Maps and how to automatically evaluate heatmap explanations in Visual Question Answering systems.

December 2018 — **SRI-CVT Shark Tank Presentation**
Won runner's up at a Shark Tank presentation on generating user-specific persuasive images and text.

May 2017 — **Mid-Atlantic Computer Vision (MACV) Workshop @ UPenn** — University of Pennsylvania
Guess what? The Visual Twenty Questions Game

Service:

Leadership — **Publicity Chair (2021 - ?), Boston University AI Research (AIR) Group**
Vice President (2016 - 2017), Tau Beta Pi, Virginia Beta Chapter

Reviewing — **ACM Multimedia 2021, CVPR 2016**

Mentoring — **Judge (2017, 2021), Blue Ridge Highlands Regional Science Fair, VA**

Non-technical:

Aug 2021 — **Dance Contest** — Prohibition Productions
Won second prize at Swing Under the Stars Dance Contest in NYC.

May 2021 — **American Sailing Association 101 Certification**
American Sailing Association 101 certification for basic keel-boat sailing

Selected Childhood Achievements/Awards:

2011 — **Near Perfect Mathematics Score, All India Central Board Examinations** — 12th Grade
97/100, Top <0.1% (99.9%ile) students in India

2007 — **National Science Olympiad**
All India Rank: 168, City Rank: 7, School Rank: 2 . Maintained a national rank < 1000 in National Science Olympiads 2008, 2009, 2010

2006 — **Opened Research Society in Middle School**
Goal of encouraging middle-school students take an interest in science. Won accolades in school/city level exhibitions.