Arijit Ray

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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**

Computer Vision, NLP, Deep Learning, Social Media Analysis (jointly with UC Berkeley)
Advisor: Prof. Kate Saenko, Prof. Bryan Plummer.

2015-2017	**M.S., Computer Engineering**	**Virginia Polytechnic Institute and State University**

GPA: 3.96 / 4.00, *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

Recent Positions

May'22 - Aug'22 **Research Scientist Intern, Meta (Facebook) AI**
FAIR Accel Perception and Action Team

Sep'21 - Present **Research Fellow, Boston University**
Profs. Kate Saenko and Bryan Plummer, Image and Video Computing Lab

Dec'21 - Present **Founder, AI+x of BU and Harvard**
A graduate student symposium investigating how AI can address pressing challenges in contemporary research

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

May'16 - Aug'16 **Deep Learning Intern, Blue River Technology**
Startup acquired by John Deere

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

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 was a key selling point for acquisition by John Deere for 305 million USD

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/UToronto/UCSD 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.