

Ramprasaath R. Selvaraju

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Research Interests	<i>Computer Vision, Interpretability, Reasoning, Vision and Language.</i> <i>I work on developing algorithms to make AI Interpretable, Transparent and Unbiased</i>
Education	Georgia Institute of Technology, Atlanta 2015 - 2020 <i>Ph.D in Computer Science</i> (Transferred from Virginia Tech in 2017) Dissertation Title: <i>Towards Interpretable, Transparent and Unbiased AI</i>
	Birla Institute of Technology & Science (BITS)-Pilani 2010 - 2015 <i>Bachelor of Engineering (Honor) in Electrical and Electronics</i> <i>Master of Science (Honor) in Physics</i>
Internships	Microsoft Research, Seattle Summer 2019 <i>With Ece Kamar, Besmira Nushi and Eric Horvitz</i> Towards evaluating and encouraging human-like reasoning abilities in deep models.
	Tesla Autopilot, Palo Alto Spring 2019 <i>With Andrej Karpathy</i> Preventing failures of autonomous systems in case of rarely occurring scenarios.
	Samsung Research America, Mountain View Summer 2018 <i>With Yilin Shen and Hongxia Jia</i> Developing algorithms for grounding and unbiasing deep vision and language models.
	Facebook, Menlo Park Spring 2017 <i>With Peter Vajda and Devi Parikh</i> Developing a framework for interpreting and visualizing Facebook's deep models.
	Virginia Tech, Blacksburg Spring 2015 <i>With Devi Parikh</i> Building curious systems that ask natural language questions about an image.
	Oxford University, Oxford Fall 2014 <i>With Philip H.S Torr and Stephen Hicks</i> Developing interactive augmented reality system for visually impaired users.
	Brown University, Providence Summer 2013 <i>With Benjamin Kimia</i> Designing a vision-based navigation system to help visually impaired people navigate through indoor environments.
Journal Articles	Grad-CAM: Visual Explanations from Deep Networks via Gradient-based Localization <u>R.R. Selvaraju</u> , M. Cogswell, A. Das, R. Vedantam, D. Parikh, and D. Batra <i>International Journal of Computer Vision (IJCV), 2019.</i>

Conference
Papers

Taking a HINT: Leveraging Explanations to Make Vision & Language Models More Grounded

R.R. Selvaraju, S. Lee, Y. Shen, H. Jia, S. Ghosh, L. Heck, D. Batra, and D. Parikh
International Conference on Computer Vision (ICCV), 2019.

Trick or TReAT: Thematic Reinforcement for Artistic Typography

P. Tendulkar, K. Krishna, R.R. Selvaraju and D. Parikh.
International Conference on Computational Creativity (ICCC), 2019.

Choose Your Neuron: Incorporating Domain Knowledge into Deep Networks via Neuron Importance

R.R. Selvaraju*, P. Chattopadhyay*, M. Elhoseini, T. Sharma, D. Batra, D. Parikh, and S. Lee
European Conference on Computer Vision (ECCV), 2018.

Diverse Beam Search: Decoding Diverse Solutions from Neural Sequence Models

A. Vijayakumar, M. Cogswell, R.R. Selvaraju, Q. Sun, S. Lee, D. Crandall, and D. Batra
Association for the Advancement of Artificial Intelligence (AAAI), 2018.

Grad-CAM: Visual Explanations from Deep Networks via Gradient-based Localization

R.R. Selvaraju, M. Cogswell, A. Das, R. Vedantam, D. Parikh, and D. Batra
International Conference on Computer Vision (ICCV), 2017.

Counting Everyday Objects in Everyday Scenes

P. Chattopadhyay, R. Vedantam, R.R. Selvaraju, D. Batra, and D. Parikh. *Computer Vision and Pattern Recognition (CVPR)*, 2017.

The Semantic Paintbrush: Interactive 3D Mapping and Recognition in Large Outdoor Spaces

M. Ondrej, V. Vineet, M. Lidegaard, R.R. Selvaraju, M. Niener, S. Golodetz, S. Hicks, P. Prez, S. Izadi, and P. Torr.
ACM Conference on Human Factors in Computing Systems (CHI), 2015.

Automated Colorimetric Analysis in Paper-based Sensors

S. Garg, R.R. Selvaraju, S. Kapur, and K. Rao
International Conference on Image Processing (ICIP), 2014.

Workshop
Papers

Taking a HINT: Leveraging Explanations to Make Vision & Language Models More Grounded

R.R. Selvaraju, S. Lee, Y. Shen, H. Jia, S. Ghosh, D. Batra, and D. Parikh
ICLR'19 Workshop on Debug ML.

Choose Your Neuron: Incorporating Domain Knowledge into Deep Networks via Neuron Importance

R.R. Selvaraju*, P. Chattopadhyay*, M. Elhoseini, T. Sharma, D. Batra, D. Parikh, and S. Lee
NeurIPS'18 Workshop on Continual Learning and NeurIPS'18 VIGIL Workshop.

Grad-CAM: Why did you say that?

R.R. Selvaraju, M. Cogswell, A. Das, R. Vedantam, D. Parikh, and D. Batra
NeurIPS'16 Workshop on Interpretable ML and CVPR'17 Workshop on Explainable Computer Vision.

Preprints	SQuINTing at VQA Models: Interrogating VQA Models with Sub-Questions R.R. Selvaraju , P. Tendulkar, D. Parikh, E. Horvitz, M. Ribeiro, B. Nushi, and E. Kamar <i>Under Review.</i>		
Invited Talks	Understanding CNNs <i>Deep Learning Class at Georgia Tech</i> <i>Fall 18</i> <i>Towards Interpretable, Transparent and Unbiased AI</i> <i>Microsoft AI Breakthroughs</i> <i>Fall 18</i>		
Teaching	<i>Data Structures and Algorithms</i> <i>Fall 15 - Spring 16</i> <i>Teaching Assistant</i>		
Technical Skills	Languages : Python, MATLAB, C++, HTML Deep Learning Frameworks : PyTorch, Tensorflow, Caffe, Torch		
Side Projects	Interpreting decisions from Deep RL agents trained for navigation		Fall 2019
	Weak supervision and Generative models for semantic segmentation		Spring 2018
	Exploring Curriculum Learning for deep models		Spring 2015
Relevant Courses	<div style="display: flex; justify-content: space-between;"> <ul style="list-style-type: none"> • Math Foundations of ML • Adv. Computer Vision • Adv. Machine Learning <ul style="list-style-type: none"> • Deep Learning • Optim. in High-dim • Bayesian Statistics <ul style="list-style-type: none"> • Prob. and Statistics • Human Robot Interaction • Linear Algebra </div>		
Reviewing	IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI) 2018 Computer Vision and Image Understanding (CVIU) Journal 2019 Computer Vision and Pattern Recognition (CVPR) 2017, 2018, 2019, 2020 Neural Information Processing Systems (NeurIPS) 2016, 2017 European Conference on Computer Vision (ECCV) 2018 IEEE International Conference on Computer Vision (ICCV) 2017		
Honors	Finalist , Adobe Fellowship		Fall 2018
	Finalist , Snap Fellowship		Fall 2018
Extra Curricular	First Place , Divisionals and Second, Mid-Atlantic Table-Tennis Championship 2016 Represented Virginia Tech , US-Canada National Table-Tennis Championship 2016		
References	Dr. Devi Parikh, Associate Professor, Georgia Tech - parikh@gatech.edu Dr. Dhruv Batra, Associate Professor, Georgia Tech - dbatra@gatech.edu Dr. Ece Kamar, Senior Researcher, Microsoft Research - eckamar@microsoft.com Dr. Stefan Lee, Assistant Professor, Oregon State University - leestef@oregonstate.edu Dr. Mohamed Elhoseiny, Research Scientist, Facebook Inc - elhoseiny@fb.com		