

# Prithvijit Chattopadhyay

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<b>RESEARCH AREAS</b>	Vision & Language, Learning with Limited Supervision, Interpretability Robust Machine Learning, Reinforcement Learning
<b>EDUCATION</b>	<b>School of Interactive Computing, Georgia Tech</b> 2019-Present <i>Ph.D. in Computer Science</i> Advised by Prof. Judy Hoffman  <b>College of Computing, Georgia Tech</b> 2017-2019 <i>M.S. in Computer Science</i> Advised by Prof. Devi Parikh <b>Thesis:</b> <a href="#">Evaluating Visual Conversational Agents via Cooperative Human-AI Games</a> Awarded M.S. Research Award  <b>Delhi Technological University (Formerly DCE)</b> 2012-2016 <i>B.Tech. in Electrical Engineering</i>
<b>RELEVANT COURSEWORK</b>	<b>Graduate Coursework</b> <ul style="list-style-type: none"><li>• Deep Learning • Machine Learning • Machine Learning Theory</li><li>• Probabilistic Graphical Models in Machine Learning</li><li>• Computability and Algorithms • Information Visualization</li><li>• Adaptive Control and Reinforcement Learning</li></ul> <b>Selected Undergraduate Coursework</b> <ul style="list-style-type: none"><li>• Control Systems • Pattern Recognition • Advanced Analog Circuit Design</li><li>• Network Analysis and Circuit Theory • Microprocessors • Digital Electronics</li><li>• Electromagnetic Field Theory</li></ul>
<b>AWARDS &amp; RECOGNITION</b>	<b>Invited to mentor students at the “New in ML” workshop</b> at NeurIPS 2019 <b>Recognized as one of the highest-scoring reviewers</b> for NeurIPS 2019 <b>Outstanding Reviewer</b> for ICLR 2019 <b>Recipient:</b> IC Student Travel Grant to attend NeurIPS 2018 <b>Among top 30% reviewers</b> for NeurIPS 2018 <b>Recipient:</b> MS Research Award (Spring 2018) - College of Computing, Georgia Tech <b>Winner:</b> VT-Hacks, 2017, a Major League Hacking event. <b>Semi-Finalists:</b> ROBOSUB - AUVSI, 2013 out of 30 participating teams <b>Finalists:</b> NIOT SAVE, 2013 out of 27 participating teams <b>Recipient:</b> Merit Scholarships for Academic Performance (2012-2014) <b>Recipient:</b> KVPY and INSPIRE Fellowships, 2012 <b>National Top 1%:</b> Indian National Physics Olympiad (InPhO), 2013
<b>PUBLICATIONS &amp; PRE-PRINTS</b> (*denotes equal contribution)	<b>DS-VIC: Unsupervised Discovery of Decision States for Transfer in RL</b> <i>arXiv 2019 (Under Review)</i> <i>Task-Agnostic Reinforcement Learning (TARL) Workshop, ICLR 2019 (Poster)</i> N. Modhe, <u>P. Chattopadhyay</u> , M. Sharma, A. Das, D. Parikh, D. Batra, R. Vedantam

**Improving Generative Visual Dialog by Answering Diverse Questions**  
*Conference on Empirical Methods in Natural Language Processing (EMNLP) 2019*  
V. Murahari, P. Chattopadhyay, D. Batra, D. Parikh, A. Das

**EvalAI: Towards Better Evaluation Systems for AI Agents**  
*arXiv 2019 (Technical Report)*  
*Workshop on AI Systems, SOSP 2019 (Poster)*  
D. Yadav, R. Jain, H. Agrawal, P. Chattopadhyay, T. Singh, A. Jain, S. Singh,  
S. Lee, D. Batra

**Choose Your Neuron: Incorporating Domain Knowledge Through Neuron-Importance**  
*European Conference on Computer Vision (ECCV) 2018 (Poster)*  
*Continual Learning Workshop, NeurIPS 2018 (Poster)*  
*Visually Grounded Interaction and Language (ViGIL), NeurIPS 2018 (Poster)*  
R. Selvaraju\*, P. Chattopadhyay\*, M. Elhoseiny, T. Sharma, D. Batra, D. Parikh, S. Lee

**Do Explanations make VQA models more predictable to a human?**  
*Conference on Empirical Methods in Natural Language Processing (EMNLP) 2018 (Poster)*  
A. Chandrasekaran\*, V. Prabhu\*, D.Yadav\*, P. Chattopadhyay\*, D. Parikh

**Evaluating Visual Conversational Agents via Cooperative Human-AI Games**  
*AAAI Conference on Human Computation and Crowdsourcing (HCOMP) 2017 (Oral)*  
P.Chattopadhyay\*, D.Yadav\*, V. Prabhu, A. Chandrasekaran, A. Das, S. Lee,  
D. Batra, D. Parikh

**It Takes Two to Tango: Towards Theory of AI's Mind**  
*Chalearn Looking at People Workshop, CVPR 2017 (Oral)*  
A. Chandrasekaran\*, D.Yadav\*, P. Chattopadhyay\*, V. Prabhu\*, D. Parikh

**Counting Everyday Objects in Everyday Scenes**  
*IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2017 (Spotlight)*  
P.Chattopadhyay\*, R.Vedantam\*, R. Selvaraju, D. Batra, D. Parikh

**Delhi Technological University: Design and Development of the Littoral AUV Zyra 2.0**  
*AUVSI RoboSub Journal 2014 (Technical Report)*

## EXPERIENCE

**Deep Learning Group, Microsoft Research AI** May 2018 - Aug 2018  
*Research Intern, mentored by Hamid Palangi*  
Improving goal-driven visually grounded dialog under the presence of an adversarial utterance evaluator

**Visual Intelligence Lab, Georgia Tech** Aug 2017 - Aug 2019  
*Research Assistant, mentored by Prof. Devi Parikh and Prof. Dhruv Batra*  
Worked on problems at the intersection of computer vision and natural language processing with a focus towards building intelligent and interpretable systems.

**CVMLP Lab, Virginia Tech** Jun 2015 - May 2017  
*Research Assistant, mentored by Prof. Devi Parikh and Prof. Dhruv Batra*  
Worked on scene-understanding problems such as object detection and counting in everyday scenes with a downstream focus towards visual question answering

**Robotics Research Lab, IIIT Hyderabad** Dec 2014 - Jan 2015  
*Research Intern, mentored by Prof. K Madhava Krishna*  
Implemented an efficient strategy for a robot to discover, recognize and navigate to a selected few objects among some scattered in an environment, based on a “guess from far and recognize from near” strategy.

**IACS, Kolkata**

Jun 2014 - Aug 2014

*Research Intern, mentored by Prof. Soumitra Sengupta*

Worked on finding Charged Rotating Black Hole solutions in Einstein-Gauss-Bonnet dilaton coupled gravity and simulated the conditions for the existence of multiple horizons in constant scalar curvature  $f(R)$  gravity.

**Autonomous Underwater Vehicle Team, DTU**

Aug 2012 - Aug 2016

*Undergraduate Researcher, mentored by Prof. R K Sinha*

**Underwater Acoustics:** Developed and implemented range estimation algorithms for Passive Source Localization from Time Difference of Arrival (TDOA) values in conjunction with machine vision techniques.

**Control Systems:** Designed control modules of the AUV. Implemented simultaneous PID loops to maintain the orientation of the AUV in motion.

**PROFESSIONAL SERVICES****Reviewing**

IEEE Conference on Computer Vision and Pattern Recognition (CVPR)	2018
Neural Information Processing Systems (NeurIPS)	2018, 2019
Association for Computational Linguistics (ACL)	2019
International Conference on Learning Representations (ICLR)	2019, 2020
International Conference on Machine Learning (ICML)	2019, 2020
European Conference on Computer Vision (ECCV)	2018

**SELECTED PROJECTS****Conditional Computation for Domain Generalization**

I'm working on the problem of domain-generalization — where trained deep networks have to generalize to novel distributions / domains at test-time in a completely zero-shot manner. I'm trying to incorporate ideas from conditional computation (selectively activating only parts of a network during a forward pass) to learn layer-wise masks that can reliably drop (or keep) the brittle (or robust) features at layer(s) whenever the network encounters a domain shift at test-time. The underlying idea is to ensure that selection of domain-specific (or domain-invariant) features emerges naturally with this setup – which might lead to a blend of interpretability and compression to some degree.

**Exploring Weak Supervision and Generative Models for Semantic Segmentation***Course Project, Probabilistic Graphical Models*

We explored weakly supervised semantic segmentation using localization cues obtained from GradCAM – a post-hoc saliency map generation approach for deep networks. We further studied semantic segmentation via deep probabilistic generative models. Specifically, we used joint VAE models with retrofitted unimodal inference networks to model the joint distribution of image, attributes and segmentation maps.

**REFERENCES**

- Prof. Judy Hoffman, Georgia Tech (email: judy@gatech.edu)
- Prof. Devi Parikh, Georgia Tech (email: parikh@gatech.edu)
- Prof. Dhruv Batra, Georgia Tech (email: dbatra@gatech.edu)
- Prof. Stefan Lee, Oregon State University (email: steflee@gatech.edu)
- Prof. Mohamed H. Elhoseiny, KAUST (email: mohamed.elhoseiny@kaust.edu.sa)
- Dr. Hamid Palangi, MSR AI (email: hpalangi@microsoft.com)