

EDUCATION

- **School of Interactive Computing, Georgia Tech** Atlanta, GA
Doctor of Philosophy in Computer Science Aug 2019 - May 2023
- **College of Computing, Georgia Tech** Atlanta, GA
Master of Science in Computer Science; Advised by Prof. Devi Parikh Aug 2017 - May 2019
- **Delhi Technological University (DTU)** Delhi, India
Bachelor of Technology in Electrical Engineering; CPI: 81.30/100 Aug 2012 - Dec 2016

RESEARCH INTERESTS

Reinforcement Learning, Vision and Language, Interpretability, Few-shot and Continual Learning

PUBLICATIONS

(* denotes equal contribution)

- **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 - Explainable Computer Vision Track, (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

MANUSCRIPTS

- **Unsupervised Discovery of Decision States for Transfer in Reinforcement Learning**
ArXiv 2019, (Under Review)
Task-Agnostic Reinforcement Learning (TARL) Workshop, ICLR 2019, (Poster)
N. Modhe, P. Chattopadhyay, M. Sharma, A. Das, D. Parikh, D. Batra, R. Vedantam
- **EvalAI: Towards Better Evaluation Systems for AI Agents**
ArXiv 2019, (Technical Report)
D. Yadav, R. Jain, H. Agrawal, P. Chattopadhyay, T. Singh, A. Jain, S. Singh, S. Lee, D. Batra
- **Delhi Technological University: Design and Development of the Littoral AUV Zyra 2.0**
AUVSI RoboSub Journal 2014, (Technical Report)

ACHIEVEMENTS

- **Outstanding Reviewer:** ICLR 2019
- **Recipient:** IC Student Travel Grant - to attend NeurIPS 2018
- **Among Top 30% Reviewers:** NeurIPS 2018
- **Recipient:** MS Research Award 2018 - College of Computing, Georgia Tech
- **Winner:** VT-Hacks, 2017, a Major League Hacking event.
- **Semi-Finalists:** ROBOSUB - AUVSI, 2013 out of 30 participating teams
- **Finalists:** NIOT SAVe, 2013 out of 27 participating teams
- **Recipient:** Merit Scholarships for Academic Performance (2012-2014)
- **Selected:** KVPY and INSPIRE Fellowships, 2012
- **National Top 1%:** Indian National Physics Olympiad (InPhO), 2013

EXPERIENCE

- **Deep Learning Group, Microsoft Research AI** Redmond, WA
Research Intern, mentored by Hamid Palangi May 2018 - Aug 2018
Improving goal-driven visually grounded dialog under the presence of an adversarial utterance evaluator.
- **Visual Intelligence Lab, Georgia Tech** Atlanta, GA
Research Assistant, mentored by Prof. Devi Parikh and Prof. Dhruv Batra Aug 2017 - Present
Working 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** Blacksburg, VA
Research Assistant, mentored by Prof. Devi Parikh and Prof. Dhruv Batra Jun 2015 - May 2017
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** Hyderabad, India
Research Intern, mentored by Prof. K Madhava Krishna Dec 2014 - Jan 2015
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.
- **Indian Association for the Cultivation of Science, Kolkata** Kolkata, India
Research Intern, mentored by Prof. Soumitra Sengupta Jun 2014 - Aug 2014
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** New Delhi, India
Undergraduate Researcher, mentored by Prof. R K Sinha Aug 2012 - Aug 2016
 - **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

- **Conference:** Reviewer for CVPR 2018, ECCV 2018, NeurIPS (2018, 2019), ICLR (2019, 2020), ICML 2019, ACL 2019

COURSEWORK

- **Graduate Coursework:** Deep Learning, Machine Learning, Probabilistic Graphical Models in Machine Learning, Machine Learning Theory, Computability and Algorithms, Adaptive Control and Reinforcement Learning
- **Selected Undergraduate Coursework:** Control Systems, Advanced Analog Circuit Design, Network Analysis and Circuit Theory, Microprocessors, Electromagnetic Field Theory, Pattern Recognition, Digital Electronics

SELECTED PROJECTS

- **Incorporating Domain Knowledge in Neurons:** We propose a simple, efficient, interpretable zero-shot learning approach. By explicitly grounding intermediate concepts captured by neurons in human-interpretable domains, our approach – Neuron-Importance Aware Weight Transfer (NIWT) – not only allows learning deep classifiers for novel classes but also helps in explaining the decisions made by such classifiers at a fine-grained level of neurons.
- **Evaluating Visual Conversational Agents:** We designed a cooperative ‘image-guessing’ game - GuessWhich - to evaluate the utility of state-of-the-art visual dialog agents by pairing them with humans. While AI literature suggests agents (chatbots) trained in such a collaborative self-play setting via RL perform better than their SL counterparts – our human studies suggest this improvement in performance does not translate to human-AI teams.

SKILLS

- **Languages:** C++, Python, Matlab, Lua
- **Libraries:** Torch, PyTorch, Tensorflow, Keras, Caffe, OpenCV, ROS, NLTK

REFERENCES

- Prof. Devi Parikh, *Georgia Tech* (email: parikh@gatech.edu)
- Prof. Dhruv Batra, *Georgia Tech* (email: dbatra@gatech.edu)
- Dr. Stefan Lee, *Georgia Tech* (email: steflee@gatech.edu)
- Dr. Mohamed H. Elhoseiny, *KAUST* (email: mohamed.elhoseiny@kaust.edu.sa)