Prithvijit Chattopadhyay
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Education

- **School of Interactive Computing, Georgia Tech** — Atlanta, GA
  Doctor of Philosophy in Computer Science; Advised by Prof. Judy Hoffman — *Aug 2019 - Present*
- **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

Computer Vision, Natural Language Processing, Few-shot and Continual Learning, Reinforcement Learning

Research 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 - Aug 2019*
  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.

Acheivements

- **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

Publications

(* denotes equal contribution)

- **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

- **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**)

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)
- Prof. Stefan Lee, *Oregon State University* (email: steflee@gatech.edu)
- Prof. Mohamed H. Elhoseiny, *KAUST* (email: mohamed.elhoseiny@kaust.edu.sa)