

# VIRAJ PRABHU

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## RESEARCH INTERESTS

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Computer Vision, Natural language processing, Interpretability, Human-AI collaboration

## EDUCATION

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2017–Present	<b>Georgia Institute of Technology</b> <i>M.S. in Computer Science (Specialization in Machine Learning)</i> Advisor: Prof. Devi Parikh
2011–2015	<b>Birla Institute of Technology and Science, Pilani</b> <i>B.E.(Honors) in Computer Science</i>

## PUBLICATIONS

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### Evaluating Visual Conversational Agents via Cooperative Human-AI Games

P. Chattopadhyay\*, D. Yadav\*, V. Prabhu, A. Chandrasekaran, A. Das, S. Lee, D. Batra, D. Parikh  
AAAI Conference on Human Computation and Crowdsourcing (HCOMP) 2017  
(\* denotes equal contribution)

### The Promise of Premise: Harnessing Questions Premises in Visual Question Answering

A. Mahendru\*, V. Prabhu\*, A. Mohapatra\*, D. Batra, S. Lee  
Conference on Empirical Methods on Natural Language Processing (EMNLP) 2017  
(\* denotes equal contribution)

### It Takes Two to Tango: Towards Theory of AI's Mind

A. Chandrasekaran\*, D. Yadav\*, P. Chattopadhyay\*, V. Prabhu\*, D. Parikh  
AAAI Conference on Artificial Intelligence 2017 (under review)  
(\* denotes equal contribution)

## RESEARCH EXPERIENCE

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Aug '16–May '17	<b>Research Scholar, Virginia Tech</b> , Blacksburg, Virginia <i>Advisors: Prof. Dhruv Batra and Prof. Devi Parikh</i> I worked at the <b>Machine Learning and Perception Lab</b> on deep learning approaches to problems at the intersection of vision and language. <b>Question Premises:</b> Developed approach to exploit visual concepts implied by VQA questions to generate a dataset and models for question relevance detection, and for data augmentation. <b>Evaluating Visual Conversational Agents Via Human-AI games:</b> Developed GuessWhich, a cooperative image guessing game played by a human and a visual dialog agent, to evaluate how progress in AI-AI teams translates to a human-AI team. <b>Towards Theory of AI's Mind:</b> Studied the ability and extent to which humans can be trained to better predict the behavior of an AI in the specific context of VQA, and the role explanation modalities play in this process.
Apr '16–Aug '17	<b>Mentor, CloudCV, Google Summer of Code 2016, 2017</b> I mentored and presently maintain the Google Summer of Code project Fabrik, an open-source web platform to collaboratively build, visualize and design neural networks in the browser.
May '14–Aug '14	<b>Research Intern, Adobe Systems</b> , Bangalore, India <i>Team: Adobe Presenter Video Express, an e-learning video creation tool.</i> <b>Real-time video segmentation:</b> Developed a graphcut-based segmentation algorithm for real-time background substitution in video that combined color, motion and shape cues and demonstrated robust segmentation across various backgrounds. The technology was transferred into <i>Magic Green Screen</i> , the marquee feature of Adobe Presenter Video Express (PVX) 11.

## TEACHING

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Fall 2016 | **Teaching Assistant, Intro to Machine Learning, Fall 2016**, Virginia Tech  
*Instructor: Dr. Stefan Lee*  
Developed machine learning challenges on Kaggle for the course.

## PROGRAMMING EXPERIENCE

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Jul '15–Aug '16 | **Member of Technical Staff, Adobe Systems**, Bangalore, India  
*Team: Adobe Captivate Prime, a newly launched Learning Management System for enterprise.*  
**Captivate Prime Android App:** Individually responsible for the Captivate Prime Android app through two release cycles, contributing with features and bugfixes for offline content play-back, syncing and UI.  
**Localization:** Implemented a scalable framework for localization and internationalization of the front-end codebase across 6 spoken languages.

Jan '15–Jun '15 | **R&D Intern, Tonbo Imaging**, Bangalore, India  
*Computer vision startup developing sensor systems for battlefields and reconnaissance.*  
**Automated Calibration:** Developed algorithm for automated calibration of company cameras using a collimator and AprilTag target setup. Applied various image processing techniques to compute field of view, focal length and optical center, reducing calibration error by over 6%.  
**Boresighting:** Developed a boresighting algorithm to precisely align a weapon's muzzle and sighting system with a target at 10m to 100m for TDS-BRS, Tonbo's video precision boresight tool.

Jan '14–Apr '14 | **Teleconferencing Using Multiple Kinects**  
*Advisor: Dr. Jagdish Raheja, Senior Scientist, CEERI Pilani*  
Developed a multithreaded application to interface multiple Kinect sensors to cover a field of vision as part of a modern teleconferencing system, and used the Kinect Skeletal Tracking and OpenCV face detector libraries to identify and display the current speaker on a central screen.

May '13–Jul '13 | **Summer Intern, Orange Business Services**, Mumbai, India  
Developed a web portal using the LAMP stack to automate customer data log creation for internal quality assessment purposes.

## SKILLS

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Languages: Python, Lua, C/C++, JavaScript, MATLAB, Java, Bash  
Technologies: PyTorch, Torch, Git, L<sup>A</sup>T<sub>E</sub>X, ReactJS, EmberJS, Android

## SELECTED COURSEWORK

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Deep Learning, Computer Vision, Machine Learning, Pattern Recognition, Information Retrieval, Parallel Computing

## AWARDS & OTHER ACTIVITIES

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Serving as reviewer for ICLR 2018 and CVPR 2018.  
Presented a demo on *Visual Chatbots* at CVPR 2017, Honolulu, Hawaii.  
*Winner*, VTHacks 2017, Virginia Tech.  
Represented CloudCV at the LDV Vision Summit, New York City 2017.  
*Winner*, Google Hackathon, APOGEE 2014, BITS Pilani.  
*Second Place*, Project Presentation, APOGEE 2013, BITS Pilani.  
*GSoC Mentor Summit 2016, 2017*: Represented CloudCV at the mentor summit in Sunnyvale, CA.

## OTHER ACTIVITIES

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### Leadership

*Editor*, *International Press* during BITS MUN 2013, BITS Pilani  
*Head Boy*, Lilavatibai Podar High School, '09-'10.  
Member of the English Press Club and the Department of Sound, BITS Pilani  
**Extra-Curricular:** Football, Long distance running, Writing