Yash Goyal

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WORK EXPERIENCE

Research Scientist 2020 - Present
Samsung Advanced Institute of Technology (SAIT) AI Lab, Montreal, Quebec, Canada

EDUCATION

Ph.D. in Computer Science 2017 - 2020
Georgia Tech, Atlanta, GA, USA
Advised by: Dhruv Batra

Ph.D. in Computer Engineering 2014 - 2017
Virginia Tech, Blacksburg, VA, USA
Advised by: Dhruv Batra
Transferred to Georgia Tech with advisor

Bachelor of Technology (B. Tech.) in Electrical Engineering 2010 - 2014
Indian Institute of Technology Gandhinagar, Gujarat, India
with Honors, and Minor in Computer Science and Engineering
GPA: 9.33/10

HONORS AND AWARDS

- Outstanding Reviewer, CVPR 2019
  (Awarded to ∼8.5% of reviewers)
- Outstanding Reviewer, CVPR 2018
  (Awarded to ∼6.9% of reviewers)
- Best Student Paper, Workshop on Visualization for Deep Learning, ICML 2016
  (Awarded for *Towards Transparent AI Systems: Interpreting Visual Question Answering Models*)
- Registration Fee Waiver Award, Deep Learning Summer School, Montreal, Canada 2016
- Dean's List for academic excellence, IIT Gandhinagar 2011, 2012, 2013, 2014
- S.P. Mehrotra scholarship, IIT Gandhinagar 2011-12
- Merit-cum-Means scholarship, IIT Gandhinagar 2010-11, 2012-13, 2013-14

PUBLICATIONS [Google Scholar][arXiv]

- Yash Goyal, Amir Feder, Uri Shalit, Been Kim. "Explaining Classifiers with Causal Concept Effect (CaCE)", *ArXiv*, 2019.

- Yash Goyal, Ziyan Wu, Jan Ernst, Dhruv Batra, Devi Parikh, Stefan Lee. "Counterfactual Visual Explanations", *International Conference on Machine Learning (ICML)*, 2019.

- Yash Goyal, Tejas Khot, Aishwarya Agrawal, Douglas Summers-Stay, Dhruv Batra, Devi Parikh. "Making the V in VQA Matter: Elevating the Role of Image Understanding in Visual Question Answering", *International Journal of Computer Vision (IJCV)*, 2018.

- Gordon Christie*, Ankit Laddha*, Aishwarya Agrawal, Stanislaw Antol, Yash Goyal, Kevin Kochersberger, Dhruv Batra. "Resolving Language and Vision Ambiguities Together: Joint Segmentation & Prepositional Attachment Resolution in Captioned Scenes", *Journal of Computer Vision and Image Understanding (CVIU)*, 2017.
  *equal contribution

- Yash Goyal*, Tejas Khot*, Douglas Summers-Stay, Dhruv Batra, Devi Parikh. "Making the V in VQA Matter: Elevating the Role of Image Understanding in Visual Question Answering", *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017.
  *equal contribution

- Gordon Christie*, Ankit Laddha*, Aishwarya Agrawal, Stanislaw Antol, Yash Goyal, Kevin Kochersberger, Dhruv Batra. "Resolving Language and Vision Ambiguities Together: Joint Segmentation & Prepositional Attachment Resolution in Captioned Scenes", *Conference on Empirical Methods in Natural Language Processing (EMNLP)*, 2016.
  *equal contribution

- Yash Goyal, Akrit Mohapatra, Devi Parikh, Dhruv Batra. "Towards Transparent AI Systems: Interpreting Visual Question Answering Models", *International Conference on Machine Learning (ICML) Workshop on Visualization for Deep Learning* ***(Best Student Paper)***, 2016.

- Peng Zhang*, Yash Goyal*, Douglas Summers-Stay, Dhruv Batra, Devi Parikh. "Yin and Yang: Balancing and Answering Binary Visual Questions", *Conference on Computer Vision and Pattern Recognition (CVPR)*, 2016.
  *equal contribution

- Harsh Agrawal, Clint Solomon Mathialagan, Yash Goyal, Neelima Chavali, Prakriti Banik, Akrit Mohapatra, Ahmed Osman, Dhruv Batra. "CloudCV: Large-Scale Distributed Computer Vision as a Cloud Service", Book Chapter, *Mobile Cloud Visual Media Computing*. Editors: Gang Hua, Xian-Sheng Hua. Springer, 2015.

- Yash Goyal, Harsh Agrawal, Clint Solomon, Dhruv Batra. "Fast Addition of New Classes to a Pre-trained ConvNet", *Mid-Atlantic Computer Vision (MACV) Workshop*, 2015.

- Deepesh Kumar, Yash Goyal, Sunil Nair, Arvind Chauhan, Uttama Lahiri. "Design of a Physiologically Informed Virtual Reality based Interactive Platform for Individuals with Upper Limb Impairment", *IEEE International System on Robot and Human Interactive Communication (Ro-MAN)*, 2014.

TALKS

- "Counterfactual Visual Explanations", *International Conference on Machine Learning (ICML)*, 2019. [Video (1:04:00 - 1:08:25)]
- "Counterfactual Visual Explanations", *Human In the Loop Learning (HILL) Workshop, ICML*, 2019. [Video (34:09 - 38:38)]
- "Counterfactual Visual Explanations", *Explainable AI Workshop, CVPR*, 2019.
- "The Visual Question Answering Challenge", *Special Session: Workshop Competitions, CVPR*, 2018. [Video (1:06:29 - 1:11:40)]
- "Visual Question Answering Challenge 2018: Overview of Challenge, Winner Announcements, and Analysis of Results", *VQA Challenge and Visual Dialog Workshop, CVPR*, 2018. [Video]
- "Visual Question Answering Challenge 2017: Overview of Dataset, Challenge, Winner Announcements, and Analysis of Results", *VQA Challenge Workshop, CVPR*, 2017. [Video (38:38 - 47:12)]
- "Towards Transparent Visual Question Answering Systems", *Visualization for Deep Learning Workshop, ICML*, 2016. [Video]
- "Yin and Yang: Balancing and Answering Binary Visual Questions", *Mid-Atlantic Computer Vision (MACV) Workshop*, 2016.

RESEARCH INTERNSHIPS

Google Brain, Mountain View, CA, USA Spring & Summer 2019
Mentors: Been Kim, Uri Shalit
- Propose a general framework to quantitatively measure the causal effect of explanations (in terms of concepts such as 'striped') on a deep model's prediction such as 'zebra'.
- Demonstrate that conditional generative models can be learned on image pixels as well as image embeddings to estimate the true causal effect of concepts.

Facebook AI Research, Menlo Park, CA, USA Spring & Summer 2017
Mentors: Dhruv Batra, Anitha Kannan, Devi Parikh
- Developed a generative model for object layout in images.
- Implemented a conditional generative model to generate images conditioned on object layout of the image.

Army Research Lab, Adelphi, MD, USA Summer 2015
Mentor: Douglas Summers-Stay
- Augmented visual question answering (VQA) dataset for abstract scenes to balance the language priors present in the dataset.
- Implemented VQA models for abstract scenes, including hand-designed image features for abstract scenes.

SIGNIFICANT ACADEMIC ACTIVITIES

- Co-organizer of VQA Challenge 2020.
- Co-organizer of VQA Challenge 2019.
- Co-organizer of VQA Challenge and Visual Dialog Workshop at CVPR 2019.
- Lead organizer of VQA Challenge 2018.
- Lead organizer of VQA Challenge and Visual Dialog Workshop at CVPR 2018.
- Co-mentor of Jingjing Pan (MS Student, Georgia Tech; now MSCV Student at CMU), 2018.
- Co-Lead organizer of VQA Challenge 2017.
- Co-organizer of VQA Challenge Workshop at CVPR 2017 and 2016.
- Reviewer for CVPR, NeurIPS, ICCV, ECCV, ICLR, ICML, TPAMI, ACM TOMM.
- Graduate Teaching Assistant for *Microcontrollers* (Fall 2014 & Spring 2015), Virginia Tech.