

# Yash Mukund Kant

Georgia Tech

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## EDUCATION

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- **Indian Institute of Technology, Roorkee** Uttarakhand, India  
*B.Tech in Electrical Engineering; GPA: 8.405/10.000* *July 2015 – May 2019*

## PUBLICATIONS

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- **Contrast and Classify: Alternate Training for Robust VQA**  
**Yash Kant**, Abhinav Moudgil Dhruv Batra, Devi Parikh, Harsh Agrawal.  
Under review / Accepted at NeurIPS Self-Supervised Learning - Theory and Practice Workshop
- **Spatially Aware Multimodal Transformers for TextVQA**  
**Yash Kant**, Dhruv Batra, Peter Anderson, Alex Schwing, Devi Parikh, Jiasen Lu, Harsh Agrawal.  
Accepted at ECCV 2020 / CVPR VQA and Dialog Workshop

## EXPERIENCE

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- **Visiting Research Scholar** Atlanta, GA  
*Georgia Institute of Technology* *September 2019 - Present*
  - **TextVQA:**
    - \* Working on Visual Question Answering (VQA) models that read and reason over text in images.
    - \* Runner Up of TextVQA Challenge 2020 at CVPR
  - **Visual Chatbot Demo (<http://demo.visualdialog.org/>):**
    - \* Ported Visual Chatbot Demo hosted on Cloud-CV from Lua-Torch backend to Pytorch.
    - \* Trained better Captioning and Visual Dialog models and implemented Beam-Search decoder.
- **Foreign Undergraduate Thesis** Singapore  
*National University of Singapore* *August 2018 - January 2019*
  - **Automated Machine Learning:**
    - \* Designed experiments to search for low memory consuming CNN architectures using Neural Architecture Search.
    - \* Implemented quantization and parameter sharing across the child models to optimize the search procedure.
  - **Resource Efficient Machine Learning:**
    - \* Explored ways to lower the compute of inference and training in ML models with quantization.
- **Software Development Intern** Bengaluru, India  
*Microsoft IDC, Bengaluru* *May 2018 - July 2018*
  - Developed a tool for to automate the creation of environments in Azure Data Lake Store.
  - Built a framework to extract configurations and detect malformed expressions in the Azure codebase.
  - Awarded with a **pre-placement offer(PPO)** for successful completion of the internship project.
- **Winter Research Intern** Singapore  
*National University of Singapore* *November 2017 - January 2018*
  - **Adversarial Machine Learning:**
    - \* Built experiments on adversarial machine learning methods like DeepFool and Fast Gradient Signed Method.
  - **Privacy in Machine Learning:**
    - \* Implemented Membership Inference Attack on ML models under a white-box setting.
- **Software Development Intern** Bengaluru, India  
*Qureto Labs* *May 2017 - July 2017*
  - Developed an android app to handle end-to-end API calls and built UI layouts in XML.
  - Launched the first version a week prior to the proposed deadline, and patched memory issues in the second version.
- **Android Development Intern** Reliance Headquarters, Navi Mumbai  
*Sizzle Labs* *November 2016 - February 2017*
  - Integrated Google Physical Web services in an android application to handle connections with nearby Bluetooth Low Energy beacons.

## PROJECTS

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- **ICLR Reproducibility Challenge 2019** December 2018 - January 2019  
*https://github.com/yashkant/Padam-Tensorflow* *Arxiv: <https://arxiv.org/abs/1901.09517>*
  - Reproduced the experiments in the ICLR 2019 submission **PADAM** in Tensorflow.
  - Exposed shortcomings of the work and proposed future directions of study.
- **Complement Objective Training for Multi-label Settings** February 2019 - April 2019  
*https://github.com/facebookresearch/pythia/pull/32* *Report: <https://bit.ly/2XnOzZI>*
  - Added a new training scheme **Complement Objective Training** to **Pythia** (Facebook's open-source framework for vision and language).
  - Analyzed non-convergence issues of Complement Objective Training with Pythia.
- **Quantized Neural Networks** August 2018 – September 2018  
*https://github.com/yashkant/Quantized-Nets*
  - Designed and conducted experiments on Binarized, Ternarized and N-bit Quantized Neural Networks in Tensorflow.
  - Performed a comparative study of quantization schemes and activation functions vs. compute needed for inference.
- **Progressive Neural Architecture Search for Secure Machine Learning** July 2018 – August 2018  
*National University of Singapore*
  - Designed and added a new penalty function proportional to latency of communication of the MLaaS protocol.
  - Quantized the search space of **PNAS** with binary networks.
- **Decision Flip Experiments** November 2017 - January 2018  
*https://github.com/yashkant/Decision-Flip-Experiments*
  - Studied and implemented adversarial machine learning methods (**FGSM**, **DeepFool**) and their explainability with **LIME**.
  - Conducted experiments studying the effect of overfitting on the classification boundaries of an ML model.
- **Skip The Queue (Microsoft Code Fun Do 2017 National Finalist)** January 2017 - March 2017  
*https://github.com/yashkant/Skip-The-Queue*
  - Developed a productivity app on Android using Physical Web and Location Services.
- **Modeling Anomalies in Temporal Data using LSTM Networks** January 2018- February 2018  
*Industry Oriented Course Project* *Supervisor: Dr. Felix Orlando*
  - Performed a comparative study of LSTM networks against simple feed-forward networks for modeling temporal data and anomalies in it.
  - Studied different types of anomalies which occur in practice in temporal data using real-world datasets.
- **Students Affairs Council Official Website** January 2017 - May 2017  
*Institute Technical Council*
  - Developed the backend of Institute's official SAC website on Python Django framework.
- **Driverless Car** April 2016 - June 2016  
*Artificial Intelligence and Electronics Society, IIT Roorkee*
  - Worked in lane detection, responsible for navigation and environment mapping.

## ACHIEVEMENTS

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- The only student of 2019 Batch at Indian Institute of Technology Roorkee to work on undergraduate thesis abroad without extending the duration of B.Tech program.
- 99.89 percentile in Joint Entrance Examination 2015 among 1.3 million students.

## RELEVANT COURSES (ONLINE) AND BOOKS

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CS231N: CNNs for Visual Recognition (Stanford)  
Linear Algebra  
MIT OCW 6.006 (Introduction to Algorithms)

Deep Learning Book (by I. Goodfellow et al.)  
Machine Learning  
Reinforcement Learning (UCL, David Silver)

## POSITION OF RESPONSIBILITIES

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- **Joint Secretary**  
*Artificial Intelligence and Electronics Society, IIT Roorkee* *May 2017 - May 2018*
  - Mentored three teams of four members each working on AI and IOT based projects.
- **Core Team Member**  
*Institute Technical Council, IIT Roorkee* *January 2017 - May 2017*
  - The group oversees technical reforms in the Institute, proposed circulation of RFID based ID cards.
- **Executive Member**  
*Counselling Cell, IIT Roorkee* *September 2015 - May 2017*
  - Served as an executive member of an active student welfare group, managed and anchored events conducted by the cell.

## REFERENCES

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**Prof. G.N. Pillai**  
Dept. of Electrical Engineering  
IIT Roorkee  
gnathfee@iitr.ac.in

**Prof. Devi Parikh**  
College of Computing  
Georgia Tech  
parikh@gatech.edu

**Prof. Dhruv Batra**  
College of Computing  
Georgia Tech  
dbatra@gatech.edu