Yash Mukund Kant

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Education

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

Experience

- **Foreign Undergraduate Thesis**
  National University of Singapore — *August 2018 - January 2019*
  - **Automated Machine Learning**:
    - Studied the literature on Neural Architecture Search with a multi-objective reward function.
    - Designed experiments to search for low memory consuming CNN architectures in the search space of Quantized Neural Networks using Efficient Neural Architecture Search.
    - Implemented parameter sharing across the child models to optimize the search procedure.
  - **Resource Efficient Machine Learning**:
    - Explored ways to lower the computational cost of inference and training in ML models.
    - 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, and how they affected the overall computational power and memory needed for inference.
- **Winter Research Intern**
  National University of Singapore — *November 2017 - January 2018*
  - **Adversarial Machine Learning**:
    - Built experiments implementing adversarial machine learning methods like DeepFool, FGSM in Tensorflow.
  - **Privacy in Machine Learning**:
    - Studied machine learning models under a white-box setting for extracting features which could be used to build Membership Inference Attacks on them.
- **Software Development Engineer Intern** — Bengaluru, India
  Microsoft IDC, Bengaluru — *May 2018 - July 2018*
  - Interned with the Azure Big Data Store Team, developed a tool for the automation of ADLS environment creation.
  - Built an end-to-end framework for extracting configurations and detecting malformed expressions in the codebase of ADLS services.
- **Software Development Intern** — Bengaluru, India
  Qureto Labs — *May 2017 - July 2017*
  - Implemented all the features and services provided by a pre-existing web module in an android application, involved writing code for handling end-to-end calls in Java and building UI layouts in XML.
  - First version was launched a week prior to the proposed deadline with all the features implemented, memory issues were encountered after testing and were patched in second version launch.
- **Android Development Intern** — Reliance Headquarters, Navi Mumbai
  Sizzle Labs — *November 2016 - February 2017*
  - Integrated Google Physical Web services into an Android Application and handled the API calls when connected to nearby devices.

Projects

- **Complement Objective Training for Multi-label Settings** February 2019 - April 2019
  https://github.com/facebookresearch/pythia/pull/32 *Report: https://bit.ly/2XnOzZI*
  - Proposed and designed modifications on top of the ICLR 2019 paper Complement Objective Training to make it suitable for multi-label settings.
  - Implemented the proposed method in Pytorch and reported results on Pythia v0.1.
  - Exposed and analyzed non-convergence issues of Complement Objective Training.
- **ICLR Reproducibility Challenge 2019** December 2018 - January 2019
  https://github.com/yashkant/Padam-Tensorflow *Arxiv: https://arxiv.org/abs/1901.09517*
  - Designed and reproduced the experiments in the ICLR 2019 submission of the paper Padam in Tensorflow.
  - Ran additional experiments to expose shortcomings of existing Padam and proposed future directions of study to address them.
- **Progressive Neural Architecture Search with Binarized Networks** July 2018 – August 2018
  National University of Singapore
  - Built experiments to search for optimal CNN architectures in a pre-defined search space using a surrogate reward function and sequential strategy.
  - Combined the architecture search strategy from PNAS with the search space of Binarized Neural Networks to search for resource-efficient and accurate architectures.
- **Decision Flip Experiments** November 2017 - January 2018
  https://github.com/yashkant/Decision-Flip-Experiments
  - Designed Experiments to analyze the classification boundaries of different ML models with Tensorflow.
  - Implemented iterative Fast Gradient Sign Method for generating adversarial examples and then evaluated the decision boundaries in their surroundings.
  - Conducted experiments studying the effect of overfitting on the classification regions of an ML model.
- **Skip The Queue (Microsoft Code Fun Do 2017 Winner)** January 2017 - March 2017
  https://github.com/yashkant/Skip-The-Queue
  - Developed an android productivity app incorporating the ideas of Physical Web and Location Services.
- **Modeling Anomalies in Temporal Data using LSTM Networks** Jan 2018- Feb 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.
  - Explored the different types of anomalies which occur in practice in temporal data and performed experiments with three real-world datasets.
- **Driverless Car** April 2016 - June 2016
  Artificial Intelligence and Electronics Society, IIT Roorkee
  - Worked in lane detection module of the project responsible for its navigation and environment mapping.
  - Localization and mapping being highly sensitive towards lighting conditions required vSLAM to be implemented. The code base was developed in Python and OpenCV was used for image processing.
- **Optical Character Recognition and Form Submission** October 2016 - February 2017
  Artificial Intelligence and Electronics Society, IIT Roorkee
  - Built a module for handwritten digits and character recognition (English) using Convolutional Neural Networks.
- **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.

Achievements

- 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

CS231N: CNNs for Visual Recognition (Stanford)
Linear Algebra
Probabilistic Graphical Models
Reinforcement Learning (UCL, David Silver)
Deep Learning Book (by I. Goodfellow et al.)
Machine Learning
MIT OCW 6.006 (Introduction to Algorithms)

Position of Responsibilities

- **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 technical improvements of using RFID cards over the presently circulating printed ones.

References

Professor G.N. Pillai
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