Yash Jain

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Education

Indian Institute of Technology Bombay — Mumbai, India
Bachelor of Technology in Computer Science — *July 2017 – August 2021*
Cum. GPA: 8.78/ 10.0
Relevant Courses: Artificial Intelligence & Machine Learning, Organisation of Web Information, Speech, Web & Natural Language Processing, Bachelors Thesis Project-1&2, Machine Learning for Remote Sensing-II

Publication

[1] J. Wang, C. Pan, H. Jin, V. Singh, Y. Jain, J. I. Hong, C. Majidi, and S. Kumar. RFID Tattoo: A Wireless Platform for Speech Recognition. *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.*, 3(4), Dec. 2019.

Experience

Automated E-commerce Question-Answering system — Summer 2020
Guide: Nikesh Garera & Nithish Pai — *Flipkart, India*

- Generated synthetic queries from a limited set of user query to increase the dataset size by more than 30%
- Combined BERT and GPT-2 models for developing a target product-type classification system which would then prompt the text-generation model to answer user query in natural language all in real-time
- System might be implemented to the company's website, subject to quality check approval

RFID Tattoo: A wireless platform for speech recognition [paper] — Summer 2019
Guide: Prof. Swarun Kumar — *Carnegie Mellon University, USA*
Best long paper award *(1 out of 121 papers)* | ***U.S. Patent pending*** — *UbiComp, 2020*

- Speech recognition platform for voice impairments through wafer-thin, battery-free and stretchable RFID Tattoos
- Collected own sensor data and implemented Random Forest model calibrated on the stretch of tags to achieve state of the art 86% accuracy on a vocabulary size of 100 most common English words

Research Projects

Dynamic link prediction of Social Networks — Autumn 2020 - Present
Guide: Prof. Soumen Chakrabarti & Prof. Abir De | Bachelor's Thesis Project-2 — *InfoLab, IIT Bombay*

- Creating a novel method for predicting the evolution of social networks across time steps

Deep Neural Matching Models for Graph Retrieval from Product Graph — Autumn 2020 - Present
Guide: Prof. Abir De & Prof. Soumen Chakrabarti | Bachelor's Thesis Project-2 — *InfoLab, IIT Bombay*

- Developing a novel deep neural network approach for searching a subgraph from a corpus of sample graphs
- Working on decreasing the query time to sub-linear time by employing LSH hashing of corpus graphs

Answer-type Inference in QA systems [report] [slides] — Spring 2020
Guide: Prof. Soumen Chakrabarti | Bachelor's Thesis Project-1 — *InfoLab, IIT Bombay*

- Outperformed an existing Answer-Type Inference RNN based manuscript system by almost 20% across 4 Question-Answering datasets by deploying BERT architecture

Awards

- Selected in **Summer Undergraduate Internship Program** at Carnegie Mellon University *2019*
- **Gold Medalist** in theory and **Silver Medalist** in practicals representing India at 11th International Junior Science Olympiad held in Mendoza, Argentina *2014*
- **All India Rank 8** in **KVPY Fellowship** by Dept. of Science & Technology, Govt. of India *2016*
- **All India Rank 29** in **JEE-Advanced** out of 220,000 shortlisted candidates from 1.2 million students *2017*
- Amongst **top 35 students** to reach Indian Team selection camp for International Astronomy Olympiad *2017*
- Selected in **top 300 students** in India to appear for Indian National Physics, Chemistry Olympiads *2017*
- Recipient of **National Talent Search Examination Fellowship** by NCERT, Govt. of India *2014*

Key course Projects

Meta Self-learning with Noisy Student Autumn 2020
Guide: Prof. Biplab Banerjee | Machine Learning for Remote Sensing-II course *IIT Bombay*
- Combined the benefits of self-training with noisy student and MAML for few-shot image classification
- While training large networks using MAML is expensive, our proposed method allows for training of large student networks using few-shot pseudo labels which outperforms the teacher learnt using MAML in fewer epochs

Adversarial Reprogramming of Neural Networks Autumn 2019
Guide: Prof. Ajit Rajwade & Prof. Suyash Awate | Digital Image Processing course *IIT Bombay*
- Reprogrammed ImageNet classification model - ResNet50v2 on MNIST dataset to perform an adversarial task by finding a single constant learnable weight matrix, added to all test inputs; achieved an accuracy of 80%
- Illustrated the vulnerability in deep neural networks that perform a task chosen by the adversary despite not being trained to do this task originally

Comparing Extractive and Abstractive Text Summarisation Autumn 2019
Guide: Prof. Ganesh Ramakrishnan | Aritificial Intelligence & Machine Learning course *IIT Bombay*
- Implemented an extractive text summarizer using the page rank algorithm, achieved a ROGUE score of f-32%
- Comparatively, the abstractive summarizer built using seq2seq model with attention mechanism, achieved a ROUGE scores of only f-13%
- Latent Semantic analysis of the generated summary and the ground truth revealed an overlap of 79%

Secure Personal Cloud Autumn 2018
Guide: Prof. Soumen Chakrabarti | Software Systems Lab course *IIT Bombay*
- Implemented a cloud-based file storing system for Linux system with block-level customizable file encryption schema allowing multiple clients to decrypt their data at real-time simultaneously or share the same
- Developed a bash interface along with a web client for an interactive user experience

Quarter to Sixth Sense Summer 2018
Institute Technical Summer Project | Electronics and Robotics Club *IIT Bombay*
- Remodeled a wearable gesture interface by programming color tracking algorithms that perform functions in correspondence with hand gestures by recognizing the color markers on fingers

Rumor - A social application Summer 2018
Seasons of Code | Web and Coding Club *IIT Bombay*
- Built an android app which broadcast rumors (messages) from one user to all users connected on the P2P network allowing each user to save, discard or share rumors by a single swipe

Position of Responsibility

Technical Head | *NGO We Listen, India* Summer 2020 - Present
- Leading a team of interns in the development of a professional website for increasing mental health awareness
- Engineering a browser extension to automatically detect hate speech content on social media platforms while synchronously hiding it before the purview of the user, creating a virtual hate-free space

Undergraduate Teaching Assistant | *IIT Bombay* Spring 2020 & Autumn 2018
Computer Programming & Utilization *Spring 2020*
- Responsible for setting algorithmic coding questions for graded and ungraded labs for 500+ freshmen

Quantum Physics & its Applications *Autumn 2018*
- Conducted weekly course tutorials for a batch of 50 freshmen and evaluated their term papers

Academic Resource Facilitator | *International Junior Science Olympiad cell (IJSO), HBCSE* Summer 2018
- Student facilitator for mentoring top 35 students from India in IJSO Selection Camp 2018

Technical Skills

Strong: Python (with Tensorflow and PyTorch), C/C++, Bash, MATLAB
Familiar: Java, SQL (Postgres), JavaScript, HTML/CSS, Android, Arduino
Tools: Git, Google Cloud Platform, LaTeX, SolidWorks

Extracurricular

- Regularly writing a technical blog, **BitShots** for discussing various ML research papers in lucid language *2020*
- Awarded with **special mention** under technical awards category by Hostel 3, IIT Bombay *2019*
- **Champion of Champions** at a State level Abacus mental arithmetic competition *2014*