Aman Jain

Curriculum Vitae

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Education

2020 **B.Tech.(Honours)**, *Computer Science & Engineering, Indian Institute of Technology Bombay, India - CPI : 8.99.*

2016 **Upper Secondary**, *DAV Public School, Kota, India - 94.4%.*

2014 **Secondary**, *Birla Shiksha Kendra, Chittorgarh, India - CGPA : 10.0.*

Work Experience

Dec 2020 ~ **Honda R&D Innovation lab**, *Tokyo, Japan*
- Working on developing human-machine interaction systems for next generation mobilities

Sep-Nov 2020 **Qure AI**, *Mumbai, India*
- Worked on a model to automatically generate a medical report from the greyscale x-ray images
- Built a novel image to text generation model based on GPT-3 and existing chest x-ray abnormality detection models and trained it on a large corpus of supervised chest x-ray data
- Evaluated its performance on various categories of abnormality reports and proposed future works for improvement

May-Jul 2019 **Samsung R&D Institute**, *Bangalore, India*
- Designed a model that uses a novel sense-attention network to disambiguate the word sense being used in the context and learns multi-sense word embeddings in the process
- Built a custom tokenization system for the above model that gives a morpheme decomposition of an input word using a self-learnt vocabulary from an English lemma graph database

May-Jul 2018 **National University of Singapore**, *Singapore*
Guide : Prof. Andrew Lim
- Improved accuracy and efficiency of pose estimation obtained by Openpose an enable it to run in real time by leveraging Kernelized Correlation Filters implemented in OpenCV
- Used the above framework to count legal push-ups from a live video in real-time for Singapore National servicemen training

Undergraduate Research Projects

Jul 2019 - Apr 2020 **Undergraduate Research Thesis** - Select, Substitute, Search (S3VQA) : A New Benchmark for Knowledge-Augmented Visual Question Answering , *IIT Bombay, India*
Guide : Prof. Ganesh Ramakrishnan, Prof. Soumen Chakrabarti, Prof. Preethi Jyoti
- Published this research work in ACM SIGIR 2021 conference.
- Designed a novel architecture for Outside Knowledge based Visual Question Answering (OK-VQA) task that exploits hypernymy relations to reformulate the question and gather more relevant external knowledge for the question
- Developed an transparent and explanatory system (S3VQA) for the above task, mitigating one of the major limitations of prior researches in the field

Spring 2019 **R&D Project**, *IIT Bombay, India*
Guide : Prof. Bernard L. Menezes
- Understood the working principles of Intel Software Guard Extensions (SGX) at OS level
- Surveyed various research works to investigate the software vulnerabilities in Intel SGX
- Carried out a high-resolution PrimeProbe cache side-channel attack exploiting flaws found in prior works and formulated a HNP to recover the secret

Scholastic Achievements

2016 Secured All India rank 32 among over 0.2 million candidates in JEE Advanced 2016, an entrance examination to get admission in the Indian Institutes of Technology (IITs)

2015 Recipient of Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship by he Department of Science and Technology, Government of India with an All India Rank 30

2012 Recieved National Talent Search Examination (NTSE) Fellowship by NCERT, Govt. of India

2016 Amongst the National top 1% in National Standard Examination in Physics conducted by IAPT

2016 Amongst top 300 students to qualify for Indian National Chemistry Olympiad conducted by ACT

Key Projects

Autumn 2018 **SafeStreet - Automated road anomaly detection**
Guide : Prof. Bhaskaran Raman
- Worked on a system to detect potholes on roads using accelerometer and GPS data collected via mobile crowd-sensing from taxi drivers in Mumbai city
- Proposed a framework to efficiently cluster pothole events by introducing a hierarchy of angular and spatial clusters using K-means and dbscan algorithms

Spring 2019 **Language Processor for a Subset of C**, *Implementation of Programming Languages Lab*
Guide : Prof. Uday Khedkar
- Built a compiler (scanner, parser and semantic analyzer) to translate programs in a C-like language into MIPS assembly code
- Implemented constructs such as Symbol Tables and Abstract Syntax Trees
- Supported functionalities like if-else statements, loops and function calls (including recursion)

Autumn 2018 **Verity - Fact checking by volunteer crowdsourcing**, *Database and Information Systems Lab*
Guide : Prof. S Sudarshan
- Designed a system for article fact-checking by crowdsourcing responses and comments from volunteers relevant to the topic
- Developed a routing algorithm and rating system to target articles incrementally to volunteers
- Built an android application for the frontend using Flutter and the backend using JDBC

Coursework

Computer Science	Information Retrieval and Mining	Artificial Intelligence and Machine Learning
	Data Analysis and Interpretation	Probability & Random Processes, Automata Theory
	Design and Analysis of Algorithms	Abstractions and Paradigms for Programming
	Network Security & Cryptography	Computer Graphics, Database & Information Systems
	Operating Systems	Implementation of Programming Languages
Mathematics	Introduction to Numerical Analysis, Calculus, Linear Algebra, Differential Equations	

Teaching

Autumn 2019 Teaching Assistant for Foundations of Network Security and Cryptography (CS 742) under *Prof. Kameswari Chebrolu*

Activities

2018 Runner up in inter-house volleyball championship

2017 Qualified JIGYASA, an inter-college annual science quiz organized by University of Mumbai

2016 Completed 80 hours of community service as a volunteer of National Service Scheme, IIT Bombay

2016 Undergone training in Squash Beginners Camp organized by the Institute Sports Council