

Samriddhi Jain

Zurich, Switzerland

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<https://samriddhijain.github.io/>

EDUCATION

ETH Zurich

M.Sc. in Computer Science

September 2019 - present

Indian Institute of Technology Mandi

B.Tech (Honours) in Computer Science and Engineering

August 2013-2017

CGPA: 9.35/10

(Summa cum laude and President of India Gold Medal Awardee)

EXPERIENCE

Astrivis (Internship)

September 2020 - February 2021

Developing software solutions for 3D reconstruction on mobile devices and embedded systems with limited compute.

ETH Zurich (Research Assistant)

March 2020 - August 2020

Worked with Center of Law, Economics and Data Science group on language modelling.

Microsoft R&D Center, India (Software Developer Engineer)

August 2017 - August 2019

Worked on Azure backup services, also part of Mixed Reality engineering and experiences development team in India.

Udacity (Nanodegree Project Reviewer and Mentor)

September 2017 - present

Reviewing projects and mentoring students in Deep Learning, Machine Learning, Flying Car Nanodegrees with projects covering concepts like CNNs, RNNs, GANs and Deep RL.

Outreachy-FOSS Round 14 (Internship)

May - July 2017

Worked with **OpenStack** on their authentication and authorization module Keystone. One of the 39 participants selected all over the world.

PUBLICATIONS

- Shikha Gupta, **Samriddhi Jain**, A D Dileep, Veena T; **Semantic Multinomial Representation for Scene Images Using Dynamic Kernel based SVMs.** *Accepted at SUNw at CVPR'16*
- Samriddhi Jain**, Renu M R, Aditya Nigam; **Object Triggered Egocentric Video Summarization.** *Accepted at CAIP'17*

RESEARCH WORK

Learning invariants for safe reinforcement learning

Guide: Prof. Martin Vechev (ETH Zurich)

March 2020 - July 2020

Semester research project focused on formal verification of security properties learnt by a RL agent. Demonstrated how using the safety properties learnt from the environment can lead to better exploration and higher rewards.

Object triggered egocentric video summarization

(Major Thesis Project)

Presented at WiCVw at CVPR'17

Guide: Dr. Renu M. Rameshan (IIT Mandi), Dr. Aditya Nigam (IIT Mandi) June 2016 - May 2017

Summarized all the instances of an object present in a given video, in near real time, supporting both semantic and exact object matching. Built a multi-stage pipeline to extract the frames in a computationally efficient way.

Anomalous Activity Localisation in prison videos (Major Thesis Project)

Guide: Dr. Renu M. Rameshan (IIT Mandi), Dr. Aditya Nigam (IIT Mandi) March - June 2017

Automatic detection and localisation of the fight instances occurring in prison videos. Used deep learning techniques like 3DConvNets and LSTMs to flag the instances as fight scenes.

PROJECTS

3D Holographic instruction videos September 2020 - December 2020

- Enabled a user to record and replay 3D instruction videos using hololens. Built a pipeline to denoise and carve out relevant depth data from hololens research mode APIs.

Scalable automated verifier for proving the robustness of neural networks against adversarial attacks November 2019

- Implemented automated verifier in Pytorch for certifying neural networks against adversarial attacks based on L_∞ norm image perturbations.

Fast subgraph isomorphism May 2020 - June 2020

- Profiled memory access patterns, compute bottlenecks of a standard subgraph isomorphism implementation. Used SIMD intrinsics, loop unrolling, scalar replacement and other optimization techniques to improve the runtime by 3X times the baseline on a single core.

Contrastive learning for single cell profiling September 2020 - December 2020

- Analysed SimCLR framework for learning cell embeddings as a method of noise reduction for single cell profiling. Did extensive experimentation on Resnet based architectures and other hyperparameters.

Implementation and visualisation of Generalised Lookahead search algorithms for solving constraint satisfaction problems May 2017

- Implemented and analysed Forward Checking, Partial Lookahead, Full Lookahead and Full AC algorithms over the basic backtracking algorithm. Added visualisation for highlighting pruning process.

Other projects like **Collaborative Real-Time Text Editor**, **AI bot for games “Battle of Kings”**, **Othello**, case studies on multidimensional SciDB datastore and Apache Spark, **Resolution Refutation strategies**, Mean-shift tracking in videos, implementation of standard pattern analysis and reinforcement learning algorithms

TECHNICAL STRENGTHS

Programming Languages: C, C++, Python, Java, C#, Swift, Scheme (Lisp)

OS: Linux environment, Windows, Mac OS

Others: OpenCV, TensorFlow, Keras, Pytorch, MATLAB, Data Parallelism using MPI, Latex

COURSE WORK (@ETH)

Advanced Machine Learning

Computer Vision

Probabilistic AI

Reliable and Interpretable AI

Advanced Systems Lab

Computational Intelligence Lab

Deep Learning

Natural Language Processing

Mixed Reality Lab

Seminar on Reinforcement Learning

Deep Learning for autonomous driving

CONFERENCES ATTENDED

Computer Vision and Pattern Recognition (CVPR) 2017, Hawaii.

OpenStack Summit 2017, Sydney

Grace Hopper Conference for Women 2015, India