

Kaivalya Swami

☎ (+91) 9521280121 • ✉ cs1170339@cse.iitd.ac.in • 📄 kaivu1999.github.io

Education

B.Tech, Computer Science and Engineering | Indian Institute of Technology Delhi | GPA – 8.512/10 2017–2021
CBSE Board, Grade 12 | Lal Bahadur Shastri School, Kota | Score – 91.20% 2017
CBSE Board, Grade 10 | AECS #1, Tarapur | Score – GPA – 10/10 2015

Publications

- Kartik Sharma, Kaivalya Swami, Aditya Shete and Samar Husain, “**Can Greenbergian universals be induced from language networks?**”, 18th International Workshop on Treebanks and Linguistic Theories (SyntaxFest), 2019.

Internships

APT Portfolio | *Mentor: Sonal Raj*
Enhanced Alerting and Monitoring System

Member of Data Management & Research Team
May 2020 - July 2020

- **Designed an end to end fast pipeline** to handle alerts of different priorities.
- Used **Kafka as a queuing mechanism** for routing alerts from different servers.
- Built C++/Python wrappers from Kafka producers APIs for producing/sending alerts to the system.
- Used MongoDB database and built a Flask web app for monitoring alerts on a dashboard.

PDCL Lab, SCSE NTU Singapore | *Supervisor: Prof. Weichen Liu*
Analysis of Quantization Techniques of Neural Networks

Research Internship
May 2019 - July 2019

- Used **BMXNet** to implement **Binarized NNs** on **CPU/GPU** in order to accelerate inference of CNNs.
- Analysed the **quantization method of XNOR-Net** practical difficulty to achieve theoretical speedup on CPU.
- Used models **AlexNet, VggNet** for experimentation to analyse speedup gain on different models.

Tensor Dynamics (IIT Delhi Startup)
Exploiting satellite images for weather forecasting

Core Member
Dec 2019 - Present

- Used **Optical Flow method for predicting cloud movement** for short span of time (Intra Day).
- Predicted solar irradiance for 3 hrs in future using cloud type and optical flow.

Selected Projects

Low Resource NMT for Indic languages. | *Prof. Parag Singla* | Undergraduate Thesis *Sept 2020 - Present*

- Ran experiments to **fine-tune mBART** for Indic Languages and analysed performance for similar languages.
- Encoding Parse Information in NMT systems and analysing accuracy gain obtained with various amounts of parallel data.
- Creation of a **Standard Test Benchmark** for translation amongst 12 Indian language pairs for facilitating further research.

Indian Sign Language (ISL) Recognition | *Prof. Jay Dhariwal* | Course Project *Oct 2020 - Jan 2020*

- Analyzed the various approaches to aid deaf people with the aim to help them interact with others.
- Built a classification model for classifying 26 alphabets of Indian Sign Language.
- Integrated the model, with Zoom/GMeet filters for realtime detection during video calls.

Linguistic Network Analysis | *Prof. Samar Husain* | Research Project *Dec 2018 - June 2019*

- Use of Universal Dependency TreeBank for making a language network with dependencies between words as edges.
- Transformed the network by inducing word order to study graph parameters.
- Showed that certain linguistic universals can be derived from the network by clustering them based on network parameters.

Other Projects

AI Bot: Canon Board Game | *Prof. Mausam* | Course Project *October 2019*

- Used **alpha beta pruning** and various heuristics to efficiently search best action possible.
- **Tournament Winner: 1st amongst 40 teams**, in a tournament amongst AI bots. (*Repo Link*)

Hand Gesture Recognition | *Prof. Chetan Arora* | Course Project *October 2019*

- Made a Real-time hand gesture recognition model to recognise 3 gestures using Pytorch. (*Repo Link*)
- Curated my own data set by collecting samples amongst friends and used various edge detection to preprocess the dataset.

- o Designed 1-player Android game, aiming to target working memory of users to make them learn good habits. ([Repo Link](#))

- o Made an interactive interface using OpenGL for graphics to simulate typical Indian road near traffic signals ([Repo Link](#))
- o Used multi-threading to implement dynamic control of simulation from keyboard and alongside a configuration file.

Teaching Experiences

- o Involved in taking lab sessions for a group of 20 students.
- o Contributed in preparation of course assignments and evaluation of quizzes and exams.

Held sessions at the hostel level solving doubts of individual students and explaining core concepts.

Relavant Courses

Principles of AI, Computer Networks, Analysis & Design of Algorithms, **Computer Vision**, Introduction to Language Science, **Machine Learning**, Operating Systems, Theory of Computation, **Database Management Systems**, Data Structures, Programming Languages, Discrete Mathematics, **Data Mining**, Logic for Computer Science., Special Topics in Machine Learning: **Deep learning***, Special Topics in Copmuter Applications: **Social Computing***, **Data-Driven Design** *Ongoing

Technical Strengths

Languages and Frameworks: Python, C/C++, Java, SQL, OCaml, Prolog, Javascript, HTML/CSS, VHDL, Bash

Tools and Platforms: Git, MXNet, PyTorch, TensorFlow, Flask, Django, BitBucket, Kafka

Scholastic Achievements

- o Secured **All India Rank 561** in Joint Entrance Exam Advanced - 2017 among 1.5 million applicants.
- o **KVPY Scholar:** Was awarded **fellowship award by IISC Bangalore** with AIR- 571.
- o **Astronomy Olympiad -NSEA :** In **top 200 students** in the country, selected to appear for INAO (2017)
- o **Physics Olympiad -NSEP:** Amongst top 1 percent students in the state Rajasthan (2017)

Extra Curriculars

- o Built SenData (A file sending service in intranet network of IIT);Gave lectures on Bash Scripting & Github.

- o Regular participant in coordination of weekly teaching program, group discussions and rural trips, conducted by the club.

Sports | Represented hostel at Inter Hostel events in Table Tennis and Tennis. Won **Gold** in Table Tennis in 2019

References

Prof Parag Singla	Associate Professor, CSE, Indian Institute of Technology Delhi	parags@cse.iitd.ac.in
Prof Samar Husain	Assitant Prof. Dept. of Humanities and Social Sciences, IIT Delhi	samar@hss.iitd.ac.in
Prof Weichen Liu	Nanyang Assistant Professor, SCSE, NTU Singapore	liu@ntu.edu.sg