

Sahasra Ranjan

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EDUCATION AND SCHOLASTIC ACHIEVEMENTS

- Indian Institute of Technology, Bombay** Mumbai, India
Bachelor of Technology - Computer Science and Engineering; GPA: 9.0/10 Aug 2019 - Present
- Achieved All India Rank **127** in Joint Entrance Examination, Advanced out of **2,40,000** candidates (2019)
- Secured All India Rank **281** in Joint Entrance Examination, Mains out of **1.2 million** candidates (2019)
- Among top students in India to get selected for Physics, Chemistry and Mathematics Olympiads (2019)
- Recipient of the prestigious **Kishore Vaigyanik Protsahan Yojana (KVPY)** Fellowship (2018)
- Awarded National Talent Search Examination **NTSE** scholarship by NCERT, Govt. of India (2017)

PUBLICATIONS

- Alexander Kroll, **Sahasra Ranjan**, Martin K. M. Engqvist, Martin J. Lercher: **The substrate scopes of enzymes: a general prediction model based on machine and deep learning**, under review at *Nature Communications journal*, 2022

RESEARCH AND WORK EXPERIENCE

Multi Constrained Code-Switched Text Modelling Autumn 2022 - Present
Guide: Prof. Preethi Jyothi, CSALT Lab | B.Tech. Project Google India + IIT Bombay

- Currently working on a generalised framework for code-switched text generation, with **multiple possible constraints** on formality, politeness, semantic similarity, etc – test tasks on English-Hindi and English-Spanish
- Exploring multiple MLM techniques based on word language to improve code-switched text generation model.
- Working on **Frequency MLM** technique which improves the text generation without the word language information.

Snapshot Metadata Garbage Collection Summer 2022
Software Engineering Internship Rubrik, Bangalore, India

- Worked on a GC algorithm for a snapshot tool in a cloud data backup and recovery system using **Go Lang & Korg**.
- Developed a mechanism to track expired **critical data** snapshots which were blocking **30-40%** of the database table.
- Ideated & implemented a framework to periodically find unnecessary snapshots and remove them from the database.

Protein Language Modeling with ESM1b-e2e Summer 2021
Prof. Martin J. Lercher, Alexander Kroll | Research Internship HHU, Dusseldorf, Germany

- Worked on a **BERT** based model on **PyTorch** to create high dimensional representations for enzyme sequences.
- Adapted **ESM-1b** model to build an E2E model which **outperformed** the existing SOTA models for the task.
- Improved accuracy for the task was achieved from **79.8%** to **87.5%** with the new richer representations of enzymes

KEY PROJECTS

SELCON: Subset Dataset Selection Sprint 2022
Guide: Prof. Ganesh Ramakrishnan | RnD Project IIT Bombay

- Worked on a subset dataset selection algorithm based on **Controlled Generalization Error** to refine dataset.

Video Denoising using Low-Rank Matrix Completion Spring 2021
Guide: Prof. Ajit Rajwade | Course Project: Advanced Image Processing IIT Bombay

- Applied **Adaptive Median Filtering** algorithm for removing impulsive noise from the spatial domain of the video.

SnapMath - Image to \LaTeX convertor Summer 2020
Institute Technical Summer Project | Institute Technical Council IIT Bombay

- Implemented a **CNN** and **LSTM** based model on **PyTorch** for generating \LaTeX expression of the input equation.

SKILLS SUMMARY

- Programming Languages** C++, Python, Go, Java, Bash, sed, AWK, TypeScript, SQL, VHDL
- Data Science** PyTorch, TensorFlow, Keras, NumPy, MATLAB, Octave, Pandas, Matplotlib, OpenCV
- Softwares and Frameworks** Git, \LaTeX , Docker, Quartus, Django, Angular, React, NodeJS, HTML5, CSS

POSITIONS OF RESPONSIBILITY

Teaching Assistant, CS725: Foundations of Machine Learning Aug 2022 - Nov 2022
Seasons of Code 2021, Mentor, Web and Coding Club, IIT Bombay May 2021-July 2021
Core Member, Electronics and Robotics Club, IIT Bombay May 2020 - April 2021
Team Member, DevCom - Development Community, IIT Bombay May 2020 - April 2021

EXTRACURRICULARS

- Performed Bollywood themed group dance during the Annual Insync Dance Show event (2022)
- Completed **Guitar** learning course under Summer School of Cult conducted by Symphony, music club of IITB (2019)