

# Sahasra Ranjan

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## EDUCATION AND SCHOLASTIC ACHIEVEMENTS

- Indian Institute of Technology, Bombay** Mumbai, India  
B.Tech - Computer Science and Engineering; GPA: **9.05/10**; Honors GPA: **9.75/10** Aug 2019 - May 2023
- Received the '**Outstanding Paper Award**' as first author at the 61st Annual Meeting of the Association for Computational Linguistics (ACL'23), awarded to **less than 1%** of the accepted papers. (2023)
- Recipient of the 'Thomas Doobie, Class of 1974 **Research Excellence Award**' for the best Bachelor's Thesis 'Novel Gradient-based Optimization Algorithm in Deep Learning' under the guidance of Prof. Preethi Jyothi (2023)
- Achieved All India Rank **127** in Joint Entrance Examination, Advanced out of **1.2 million** candidates (2019)

## PUBLICATIONS

- [**119 citations**] Alexander Kroll, **Sahasra Ranjan**, Martin K. M. Engqvist, Martin J. Lercher: **A general model to predict small molecule substrates of enzymes based on machine and deep learning**, published in the *Nature Communications journal*, 2023 📄
- [**Outstanding Paper Award**] **Sahasra Ranjan**, Richeek Das, Shreya Pathak, Preethi Jyothi: **Improving Pretraining Techniques for Code-Switched NLP**, accepted at the *61st Annual Meeting of the Association for Computational Linguistics (ACL)*, 2023. 📄
- Alexander Kroll, **Sahasra Ranjan**, Martin J. Lercher: **A multimodal Transformer Network for protein-small molecule interactions enhances predictions of kinase inhibition and enzyme-substrate relationships**, published at *PLOS Computational Biology*, 2024 📄

## RESEARCH AND WORK EXPERIENCE

**Mathkraft** Nov 2024 - May 2025  
CTO and Co-Founder San Francisco, USA

- Built an **AI MathTutor** for K-8 kids in the U.S., with visual, conversational learning and custom adventures.
- Achieved **\$60K+ ARR in 6 months** with semi-annual and annual subscriptions from parents and microschoools.
- Maintained **97%+ monthly retention** and an average **NPS of 9+**, reflecting strong product-market fit.

**Rubrik: Software Engineer** June 2023 - July 2024  
Full-Time Software Engineering Rubrik, Bangalore, India

- Part of the **Data Life Cycle** team, responsible for snapshot management policies for Rubrik Data-Security Solutions
- Designed and implemented a GC framework to periodically remove expired and unnecessary data, unblocking **80%+** of a **critical DB table** and saving Snowflake costs and performance, for the Rubrik SaaS offering.
- Innovatively implemented features to support static versioning of data, thereby enhancing stable testing capabilities.

**Enzyme-substrate predictor** May 2021 - June 2023  
Prof. Martin J. Lercher, Alexander Kroll | Research Scholar HHU, Dusseldorf, Germany

- Published** the SOTA **Enzyme-substrate predictor model** in **Nature Communications** (119 citations).
- Published **Pro-Smith**, another general-purpose enzyme-substrate predictor that achieves **94.2% accuracy**. Surpassing our previous SOTA, actively being used in Drug-discovery and Biotechnology. <https://esp.cs.hhu.de/ESP>.
- With both models, improved accuracy for the ESP task from  $\sim 80\%$  to **94.2%**, and other downstream tasks.

**Improving Pretraining Techniques for Code-Switched NLP** July - May 2023  
Guide: Prof. Preethi Jyothi, CSALT Lab | B.Tech. Project IIT Bombay

- Introduced the 'Switch-MLM' pretraining, optimizing MLM by leveraging switch-points within code-switched text.
- Awarded the **ACL'23 Outstanding Paper Award**, bestowed to less than 1% of accepted papers, as the **first author** of 'Improving Pretraining Techniques for Code-Switched NLP', introducing innovative MLM methods.
- Enhanced multilingual models with residuals and auxiliary loss, boosting F1 scores by 3-4% in diverse language pairs.

## LEADERSHIP POSITIONS

**Founder and CTO, Mathkraft** Nov 2024 - May 2025  
**Teaching Assistant, CS725: Foundations of Machine Learning** Aug 2022 - Nov 2022  
**Teaching Assistant, CS753: Automatic Speech Recognition** Jan 2023 - May 2023  
**Department Academic Mentor, Computer Science and Engineering Dept., IIT Bombay** May 2022-April 2023  
**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)