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 Dooie, 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

1. [**124 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* 📄

2. [**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.* 📄

3. 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 microschools.
- Maintained **97%+ monthly retention** and an average **NPS of 9+/10**, reflecting strong product-market fit.

Rubrik: Software Engineer — June 2023 - July 2024
Full-Time Software Engineering — 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.
- Designed and 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** (124 *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 2022 - 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

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)*