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. [**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.* 📄

2. [**152 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* 📄

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 neurodivergent K–8 learners with visual, conversational adventure-based learning.
- Scaled to **120+ learners**, generating $60K annualized revenue in 6 months, maintaining **97%** retention, NPS **9/10**.
- Led AI and product; pivoted from pure tutoring to **social-learning models** after user insights.

Rubrik: Software Engineer   *June 2023 - July 2024*
Full-Time Software Engineering   *Bangalore, India*
- Built **large-scale automation** for SLA lifecycle, **archival** reliability, and snapshot metadata in Rubrik's platform.
- Modernized legacy test frameworks, improved CI/CD resilience across **multi-DB systems** (HANA, DB2, NoSQL).
- Partnered with **infra** and **data teams** to enhance **scalability** and **fault tolerance** in **distributed cloud systems**.

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.

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** (152 *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.

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)*