Kiran Purohit

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Github, Google Scholar, DBLP

Research Agenda

Application of Subset Selection in Robust and Efficient Machine Learning: My research focuses on developing subset selection methods to make ML models efficient and robust while achieving performance comparable to full sets. These techniques identify the most representative elements, reducing computational demands and eliminating potentially harmful or redundant elements that could degrade model performance.

Education

IIT Kharagpur West Bengal, India
Ph.D. Scholar, Computer Science & Engineering 2020–2025
Supervisor: Prof. Sourangshu Bhattacharya

NIT Durgapur West Bengal, India
M.Tech, CGPA: 9.15/10 2018–2020

Publications

[1] **K. Purohit**, S. Das, S. Bhattacharya, and S. Rana, "A data-driven defense against model poisoning attacks on federated learning", in *European Conference on Artificial Intelligence **(ECAI)***, 2024.

[2] **K. Purohit**, A. Parvathgari, and S. Bhattacharya, "A greedy hierarchical approach to whole-network filter- pruning in cnns", in *Transactions on Machine Learning Research **(TMLR)***, 2024.

[3] **K. Purohit**, Venktesh, Raghuram, Krishna, Sourangshu, and Avishek, "Explora: Efficient exemplar selection for complex reasoning", in *Empirical Methods in Natural Language Processing **(EMNLP)***, 2024.

[4] **K. Purohit**, Anurag, Soumi, and Sourangshu, "Accurate and efficient channel pruning via orthogonal matching pursuit", in *International Conference on **(AI-ML Systems)***, 2023, ISBN: 978-1-4503-9847-3.

[5] **K. Purohit**, A. Kesarwani, D. R. Kisku, and M. Dalui, "Covid-19 detection on chest x-ray and ct scan images using multi-image augmented deep learning model", in *International Conference on Mathematics and Computing **(ICMC)***, Springer Nature Singapore, 2022, pp. 395–413, ISBN: 978-981-16-6890-6.

[6] A. Kesarwani, **K. Purohit**, M. Dalui, and D. R. Kisku, "Measuring the degree of suitability of edge detection operators prior to an application", in *Applied Signal Processing Conference **(ASPCON)***, 2020.

Ongoing Works

- A Challenger Sampling-based top-m Arm Identification for In-Context Exemplar Selection (submitted)
- The Power of Noise: Data Mixing in RAG For Complex QA
- Backward Elimination for pruning of Transformers

Technical Skills

- **Programming Languages:** C, C++, Python, Java, PHP, ASP, C#, HTML, CSS
- **Frameworks:** Pytorch, Tensorflow, Keras, spacy, nltk, scikit-learn, Pandas, Numpy, Matplotlib

Scholarships & Awards

- Won second price at IBM Maitreyee Research Showcase   2024
- Invited to attend Amazon Research Days (ARD) in India   2024 & 2021
- Invited to attend ACM India Grad Cohort   2024
- AI4ICPS Chanakya PhD Fellowship   2024–2025
- Institute Fellowship for PhD   2020–2025
- MHRD Gate Scholarship   2018–2020
- BSF Director General's Merit Scholarship   2013–2014
- Prime Minister's Scholarship Scheme for CAPF & Assam Rifles   2013–2017

Popular / News Articles / Media Coverage

- COVID-19 Detection, Genomics & Health Impact Weekly Scan — PHGKB, Jul 2020. Our paper got enlisted in the **Centers for Disease Control & Prevention under the US Department of Health.**
- COVID-19 Detection Literature Situation Report, Our COVID-19 work was featured in the Daily Newsletter of the **Department of Global Health, University of Washington.**

Teaching Assistant

- **TA** for Virginia Tech-IIT KGP Joint Certification Program In Business Analytics and AI   2023-2024
- **TA** for AICTE QIP PG Certificate Programme for Core Engineering Faculty   2024
- **TA** for Scalable Data Mining (CS60021) at IIT Kharagpur   Autumn 2024, 2023, 2022 & 2021
- **TA** for Software Engineering Lab & Theory (CS29202) at IIT Kharagpur   Spring 2024 & 2023
- **TA** for Foundations of Algorithm Design and Machine Learning (CS60020) at IIT Kharagpur   Spring 2022

Projects

- **Course Content Management System (CCMS)** (2017)
  Worked on this project in B.Tech using Front End-PHP & Back End-MySql
  It provides framework for teaching and management of online course content.

- **SeasonsWay: Shopping Site** (2016)
  Worked on this Project in B.Tech using Front End-JSP & Back End-MySql
  A shopping website that is mainly for the locals of Tehri and Baurari.

- **Network Docket Management System** (2016)
  Worked on this Project at **DRDO** using Front End-ASP & Back End-Oracle
  Generates a distinct docket number for every complaint registered with date.

Extracurricular Activities

- English Debate, English Essay Writing, Hindi Extempore Speech, Quiz Competition, Science Quiz Competition, Sanskrit Shloka Recitation, Calligraphy, Hindi Essay Writing, Mono Acting and Group Song.
- Yoga, Swimming and Table Tennis enthusiast

References

References will be provided on request.