YUSUF BAIG

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EDUCATION

New York University (Courant Institute of Mathematical Sciences), New York City, NY — May 2026
Master of Science in Computer Science
Coursework: Operating system, Programming Languages, Natural Language Processing

Manipal Institute of Technology, Udupi, India — May 2022
Bachelor of Technology in Information and Technology, Minor in Computational Intelligence
Coursework: Linear Algebra, Distributed Systems, Statistics, Machine Learning, Computer Vision

EXPERIENCE

Multimodal Digital Media Analysis (MIDAS) Lab — **Delhi, India | February 2022 – August 2024**
Research Assistant – Legal AI — Advisor: Dr. Jessy Li, Dr. Rajiv Ratn Shah

- Implemented GNNs for Legal Judgment Prediction, leveraging node classification techniques with advanced XLNet-based embeddings to model judicial case structures, achieving a macro F1 score of 75%.
- Developed and evaluated zero-shot Legal Judgment Prediction methods using multiple LLMs, leveraging techniques such as Rhetorical Role structuring, Contextualized Case-aware Templates (CCaT), and metadata integration to simulate judicial reasoning processes, achieving a 10% improvement in F1 score compared to traditional approaches.

Carl Zeiss R&D — **Bangalore, India | January 2022 – June 2024**
Software R&D Engineer – Image Processing and Backend

- Studied and implemented advanced image processing techniques, mainly calculating a 3D volume's Contrast Discrimination Function and Modulation Transfer Function for an Aerospace client.
- Formulated and executed a complex set of algorithms targeting pixel intensity adjustments, resulting in a streamlined workflow that saved an average of 10 hours in a 30-hour project timeframe during the image processing phase.

Samsung Prism Project — **Udupi, India | August 2021 – December 2021**
Undergraduate Research Assistant - Natural Language Processing

- Developed a Multilingual Word Sense Disambiguation system by enhancing the Lesk algorithm, improving accuracy across three languages, and created 'hindiwsd,' a Python-based framework for transliteration, spell correction, POS tagging, and word sense disambiguation of Hindi text, enabling advanced natural language processing for Hinglish code-mixed text.

PUBLICATIONS AND RESEARCH PROJECTS

Zero-shot Legal Judgment Prediction: How ready are LLMs on legalese?
[UNDER REVIEW]

Exploring Graph Neural Networks for Indian Legal Judgment Prediction
PrePrint: arXiv 2023

HindiWSD: A package for word sense disambiguation in Hinglish & Hindi
LREC 2022

Severity Classification of Mental Health-Related Tweets
IEEE 2021, ICML CA2MH 2021

Curb Your Carbon Emissions: Benchmarking Carbon Emissions in Machine Translation
arXiv 2021

Assessing the Carbon Intensity of Models Across Different Languages
ICML WiML 2021

PROJECTS

Development of the MAPLE Score for Evaluating LLMs in Mathematical Reasoning

- Designed the MAPLE score, a holistic metric to assess reasoning misalignment in LLMs by integrating error rates, redundancy, and validity.
- Developed a multi-stage evaluation framework to identify reasoning pitfalls and improve LLM performance on complex mathematical tasks.

TEACHING EXPERIENCE

CSCI-UA 381 Programming Tools for the Data Scientist — January 2025 - Present

- Teaching Machine Learning and the tools required to master it in Python to undergrad students.

SKILLS

Languages	Python, C++/C, C#, MATLAB, SQL, Java, HTML, CSS, LaTeX, Racket
ML Frameworks	PyTorch, HuggingFace, pandas, LangChain, NumPy, scikit-learn, seaborn, matplotlib
Frameworks	HPC, Git, GitHub, Docker, Flask, Jira, BitBucket, .NET, MongoDB, AWS, Linux