Mihir Panchal

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EXPERIENCES

Georgia Institute of Technology & National Institute of Disaster Management **August 2025 – Present**
Generative Modeling for Disaster Management — Dr. Ying-Jung Chen, Dr. Surya Parkash Neurips 2025

- Developed CC-GRMAS, a multi-agent graph neural system for spatiotemporal landslide risk forecasting, integrating GNNs, Retrieval-Augmented Generation, and graph databases for proactive disaster preparedness.
- Collaborated with a cross-institutional team to preprocess NASA's Global Landslide Catalog, design spatial graphs, and evaluate graph-based models achieving 0.79+ F1-score while reducing model complexity by 99.9%.

King's College London & National University of Singapore **June 2025 – Present**
Reasoning and Interpretability of LLMs — Dr. Mamta Sahni, Dr. Deeksha Varshney IJCNLP AACL 2025

- Advanced multi-lingual LLM reasoning and interpretability, leveraging reasoning chains, circuit tracing, logit lens, and attention head analysis to enhance model transparency and performance across diverse linguistic tasks.
- Conducted systematic probing over model internals by recording activations across residual streams, attention layers, attention output projections, and MLP blocks to trace information flow and identify causal pathways.

IIT (ISM) Dhanbad & IIT Jodhpur **June 2025 – Present**
Graph Representation Learning in LLMs — Dr. Manoj Kumar Dr. Deeksha Varshney In Preparation for COLM 2026

- Optimized Graph of Thoughts reasoning using Block Successive Upper-bound Minimization and graph coarsening on GSM8K dataset, finetuning models to improve scalability and efficiency for complex reasoning tasks in LLMs.
- Proposed a graph structured reasoning framework that abstracts reasoning chains into compact representations, enabling models to perform multi-step reasoning without explicit prompting or additional finetuning.

AI-NLP-ML Research Group IIT Patna **December 2023 – November 2025**
Computational Linguistics in Peer Review — Dr. Prabhat Bharti, Dr. Mayank Agarwal 4x Q1 Journal (Springer)

- Implemented GraphRAG to assess peer review consistency, leveraging knowledge graphs and counterfactual reasoning at word, sentence, and aspect levels to improve transparency and reliability in review processes.
- Engineered InsightfulPeer to assess peer review thoroughness via Chain-of-Thought reasoning with LLMs, classifying reviews as exhaustive or trivial to enhance fairness and interpretability in scholarly evaluation.

Infiheal Healthcare Private Limited **June 2024 – August 2024**
Software Engineering Intern — Ms. Srishti Srivastava, Mr. Vipul Chivate Forbes Top 100 Startups 2024

- Boosted model accuracy by 15% using advanced AI, improved data processing efficiency by 20% with classification models, and built robust mental health AI apps using FastAPI, Docker, Git, and AWS for cloud deployment.
- Utilized AWS services to improve system reliability by 25%, cut infrastructure costs by 30%, automated workflows achieving a 40% reduction in processing time, and collaborated with multidisciplinary teams in agile environments.

RESEARCH PUBLICATIONS

CC-GRMAS: A Multi-Agent Graph Neural System for Spatiotemporal Landslide Risk Assessment in High Mountain Asia | Neural Information Processing Systems (NeurIPS) **DOI**

- **Mihir Panchal**, Ying-Jung Chen, Surya Parkash | Paper, Code, Data, Simulation, Poster, Presentation

Interpretable Reasoning Enhancement in Large Language Models through Puzzle and Ontological Task Analysis | International Joint Conference on Natural Language Processing (IJCNLP AACL) **Accepted**

- **Mihir Panchal** | Thesis Proposal | Paper, Poster

Not all peer reviews are significant: A Dataset for Good (Exhaustive) vs Bad (Trivial) Scientific Peer Reviews Leveraging Chain-of-Thought Reasoning | Scientometrics, (Springer) **DOI**

- Prabhat Kumar Bharti, **Mihir Panchal**, Viral Dalal, Mayank Agarwal, Asif Ekbal | Paper Code, Simulation

Co-Reviewer: Are LLMs on the Same Page as Human Reviewers? An Agentic AI Framework for Evaluating Review Quality and Consensus | Scientometrics, (Springer) **Accepted**

- Prabhat Kumar Bharti, Viral Dalal, **Mihir Panchal**, Mayank Agarwal, Asif Ekbal | Code

LEDGE : Leveraging Dependency Graphs for Enhanced Context-Aware Documentation Generation | Automated Software Engineering, (Springer) **Preprint**

- **Mihir Panchal**, Arnav Deo, Prinkal Doshi, Varad Prabhu, Chetashri Bhadane | Code

Indic-TunedLens: Interpreting Multilingual Models in Indian Languages | International Joint Conference on Natural Language Processing (IJCNLP AACL) **Minor Revision**

- **Mihir Panchal**, Deeksha Varshney, Mamta Sahni, Asif Ekbal | Code, Simulation

ConsistentPeer: Reviewers Through GraphRAG-Driven Counterfactuals to Measure Consistency in Peer Review | Scientometrics, (Springer) **Minor Revision**

- Prabhat Kumar Bharti, **Mihir Panchal**, Viral Dalal | Code

PeerGauge: a Dataset for Peer Review Disagreement and Severity Gauge | Language Resources and Evaluation, (Springer) **In review**

- Prabhat Kumar Bharti, **Mihir Panchal**, Viral Dalal | Code, Data

Game Machine and Algorithm towards Trends in Game States using Machine Learning and Deep Learning | 2023 10th International Conference on Computing for Sustainable Global Development **DOI**

- **Mihir Panchal**, Chintan Jagdish Dodia, Pankaj Dulabhai Rathod

PROJECTS

CiteSpy | GitHub Marketplace Semantic Scholar Youtube **Downloads 222+**

- Developed a Visual Studio Code extension that enhances coding and research efficiency by automatically scraping and displaying academic paper summaries, titles, and links, streamlining research workflows within the editor.

Engraph | GitHub Website Youtube **Mozilla Fellowship**

- Engineered an AI-powered code documentation generator using static code analysis and GraphRAG, that enables LLM-enhanced, structured documentation with interactive dependency graphs for improved code comprehension.

InsightHound | GitHub Website Youtube **100x Buildathon Winner**

- Deployed an AI-driven research agent with LangChain, boosting startup decision-making efficiency by 126% through data-driven insights and actionable strategies for competitive advantage and product-market fit.

CommentCleaner | GitHub Marketplace Youtube **Downloads 2189+**

- Programmed a cross-language Visual Studio Code extension that automates source code cleanup and standardization for 10+ programming languages, boosting readability and developer efficiency

TEACHING EXPERIENCES

Why Research Papers? A Comprehensive Guide | *DJSACM Research Seminar* **Youtube**
Transformers in AI: From Perceptrons to Generative Models | *SBMP Alma Mater* **GitHub Event**
Building Intelligent Applications with LangChain and LLMs | *TFUG ML Mumbai* **GitHub Event**
Breaking Into Research: AI/ML Foundations, Careers, and Publications | *CSI-ACE* **GitHub Event**
Leveraging Boto3: Pythonic access to S3 and SNS on AWS | *Mumpy June Meetup 2024* **GitHub Event**
From Code to Community: Publishing PyPI Packages | *FOSS United June Meetup 2024* **GitHub Event**
Unlocking the Power of Computer Vision with Mediapipe | *Mumpy March Meetup 2024* **GitHub Event**
Mastering Python: A Hands on Workshop for Developers | *NMIMS Navi Mumbai* **GitHub Youtube**

TECHNICAL SKILLS

Languages : Python, CUDA, Shell, Latex, C, C++, Java, SQL, Javascript, Typescript
Dev Tools : Linux, AWS, GCP, Docker, Kubernetes, Hugging Face, Wandb, Overleaf, GitHub
Frameworks : TensorFlow, PyTorch, FastAPI, Flask, OpenCV, Langchain, Streamlit, Keras, Selenium

EXTRACURRICULAR ACTIVITIES

Research Head at Association for Computing Machinery | *DJSACM* **Youtube**

- Mentored 60+ students in research methodologies and technical writing; conducted 5+ workshops on research paper writing, publishing strategies, and core technical skills to enhance academic and professional development

Responsible AI Fellowship | *SimPPL funded by Mozilla* **Project Details**

- Applied knowledge graph driven representation learning with GraphRAG to generate enriched embeddings that integrate syntax, semantics, and structural properties of large scale software systems

EDUCATION

University of Mumbai - Dwarkadas Jivanlal Sanghvi College of Engineering **8.87 CGPA**
Bachelor of Technology in Computer Engineering, Honors in Intelligent Computing August 2023 – May 2026

Shri Bhagubhai Mafatlal Polytechnic and College of Engineering **9.45 CGPA**
Diploma in Information Technology August 2020 – May 2023