

Mohit Kumar Meena

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SUMMARY

AI researcher with 5+ years in machine learning research and development, including 3+ years of industrial research at Fujitsu Research of India, leading end-to-end research from problem formulation and novel algorithm development to patent filings and proof-of-concept solutions for industry clients. Current research centres on LLM-based autonomous and multi-agent systems, executable environments for enterprise agent training, and scalable graph learning on graphs with hundreds of millions of nodes and billions of edges.

EXPERIENCE

Fujitsu Research of India

Bengaluru | Jul 2023 – Present

AI Researcher II, promoted from AI Researcher I within 11 months

Jun 2024 – Present

LLM AGENTS AND MULTI-AGENT SYSTEMS

- **Adaptive topology learning for LLM multi-agent systems** First author • ICLR 2027 submission
Developed a reinforcement learning framework that autoregressively learns sparse, task-adaptive agent communication topologies from execution feedback and performs targeted failure-aware repair. Built the multi-GPU training and inference pipeline, achieving **73% Pass@1** on LiveCodeBench (vs. 58% for the strongest baseline) and **39%** lower end-to-end token consumption on GSM8K.
- **Synthesizing executable enterprise environments for LLM agents** Co-author • NeurIPS 2026
Co-led the development of a framework that automatically synthesizes executable replicas of closed-source enterprise applications from documentation, including functional APIs, databases, and agent tools. Enabled environment-based agent training, improving an 8B LLM's task accuracy by **52%**. Developed the end-to-end web platform for environment generation.

EFFICIENT AND SCALABLE GRAPH LEARNING

- **Adaptive selection and fusion of graph learning models** First author • AAAI 2026
Introduced a framework that learns, for every node, which graph neural network architectures to use and how to combine them, pruning weak models during training. Matched or outperformed strong baselines on **16 benchmarks**, with gains of up to **22%** on link prediction, graph-level and node classification task.
- **Scalable and memory-efficient graph learning** First author • AAAI 2027 submission
Developed GraphDDR, a divide–distill–route framework combining structure-aware graph partitioning, multi-teacher distillation, and sparse expert routing to scale GNN training to graphs with hundreds of millions of nodes and billions of edges. Achieved up to **4.5× speedup** and **89% lower GPU memory** consumption.
- **Matrix sketching for fast graph neural network training** Co-author • TMLR 2026
Co-developed a method that compresses the graph before training, with provable optimality for linear models. On a 111M-node graph it trains in under **8 GB** of GPU memory with roughly **339×** faster epochs.

CLIENT ENGAGEMENTS

- **Real-time fraud detection for a payment corporation in Vietnam** Proof of concept
Led a client engagement in Hanoi, engaging directly with senior leadership to define fraud scenarios, data requirements and success criteria. Spearheaded the project and authored the technical proposal for a real-time fraud detection system built on streaming graph AI.
- **Tax-evasion detection on billion-scale taxpayer graphs in Italy** Client deployment
Developed and deployed an end-to-end graph AI pipeline for a heterogeneous graph with billions of nodes, decoupled from the production graph database. Designed a graph transformer to address label scarcity and high-degree hubs, leveraging edge features for a **3%** improvement in downstream performance. Built an interactive visualization tool for million-node graphs.

PUBLICATIONS AND PATENTS

- [C1] **M. Meena**, Y. Punjabi, A. A, V. Sharma, M. Chandran. **Self-Adaptive Graph Mixture of Models**. **AAAI 2026**. Presented at AAAI-26, Singapore. [\[Paper\]](#) [\[arXiv\]](#) [\[Code\]](#)
- [J1] A. A, M. Kaul, **M. Meena**, M. Chandran. **Proper Orthogonal Decomposition for Scalable Training of Graph Neural Networks**. **TMLR 2026**. [\[OpenReview\]](#)
- [C2] **From Manuals to Worlds: Synthesizing Executable Enterprise Environments for LLM Agents**. **NeurIPS 2026**. Co-author.
- [S1] **Memory-Efficient Training of Graph Neural Networks on Web-Scale Graphs**. **Submitted to AAAI 2027**. First author.
- [S2] **Adaptive Task Allocation and Communication for Collaborative LLM Agent Teams**. **Submitted to ICLR 2027**. First author.
- [W1] S. A. Nasser, N. C. Kurian, **M. Meena**, S. Shamsi, A. Sethi. **WSSAMNet: Weakly Supervised Semantic Attentive Medical Image Registration Network**. **MICCAI BrainLes Workshop 2022**.
- [P1] S. A. Nasser, S. Pathak, K. Singhal, **M. Meena**, N. Gupte, A. Chinmaya, P. Garg, A. Sethi. **Utilizing Radiomic Features for Automated MRI Keypoint Detection: Enhancing Graph Applications**. **BIOIMAGING 2024**, part of BIOSPEC. [\[DOI\]](#) [\[arXiv\]](#)
- [P2] S. A. Nasser, **M. Meena**, G. Sresth, A. Sethi. **Leveraging Segmentation to Improve Medical Image Registration**. Preprint, 2023.

Patents: three applications filed through Fujitsu as primary inventor, on self-adaptive graph mixture of models, memory-efficient large-graph training, and multi-agent LLM collaboration and failure repair.

Service: peer reviewer for AAAI, KDD and ICLR.

ACADEMIC RESEARCH PROJECTS

- **Master's thesis: Multimodal image registration for image-guided surgery** Advisor: Prof. Amit Sethi
Developed CNN and Vision Transformer models for registration and segmentation across X-ray, MRI, CT, laparoscopic and ultrasound imaging. Preceding R&D work produced a weakly supervised attention model that is **6%** more robust than VoxelMorph, the SoTA learning-based baseline.
- **Low-light image enhancement for driver-assistance systems** Course project • IIT Bombay, 2021
Synthesised realistic night-time scenes from the BDD100K driving dataset and trained pix2pix GAN, CAN and U-Net models that clearly outperformed classical CLAHE and Retinex methods.
- **Deep learning for diabetic retinopathy detection** NIT Uttarakhand • 2021
Built a transfer-learning pipeline on a pretrained ResNet50 with data augmentation to handle class-imbalanced, noisy fundus images across multiple severity classes, reaching **97.2%** accuracy.

EDUCATION

Indian Institute of Technology (IIT) Bombay M.Tech, CPI 9.29/10	2021 – 2023
National Institute of Technology (NIT) Uttarakhand B.Tech, CPI 8.90/10	2017 – 2021

TECHNICAL SKILLS

Research Expertise	Large language models, LLM agents, multi-agent systems, reinforcement learning, graph neural networks, knowledge distillation, mixture of experts
ML Frameworks	PyTorch, PyTorch Geometric, Hugging Face Transformers, vLLM, TensorFlow
Systems and Engineering	Python, C++, SQL, distributed training and inference, Docker, MCP, Neo4j

LEADERSHIP

- **Team lead, Fujitsu Research:** led a team of 3 researchers and 2 interns building the enterprise software replicas used to train and evaluate LLM agents.
- **Mentoring and stakeholder communication:** guided a group of engineers in building an pipeline and interactive demo of the multi-agent LLM research for Fujitsu leadership.
- **Institute Secretary, Academic Affairs, IIT Bombay:** led a 75+ member council representing 3,300+ Master's students and ran 30+ institute-wide events.