Mir Nafis Sharear Shopnil

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Research interests: Causal reasoning with LLMs; multi-agent systems for policy evaluation; mechanistic interpretability of agentic workflows; graph-based causal inference for real-life use cases.

EDUCATION

Queen Mary University of London, London, UK   Sep 2022 – Sep 2023
- MSc in Artificial Intelligence — Merit (2:1)

BRAC University, Dhaka, Bangladesh   Jan 2017 – Oct 2021
- BSc in Computer Science — CGPA 3.45; VC's List (Summer 2020, Fall 2020); Dean's List (2017)

PUBLICATIONS & PREPRINTS

- **Sharear Shopnil, M. N.**, Duwal, S., Tyagi, A., & Proma, A. M. (2025). *Agentic Framework for Misinformation Detection with Rationale Generation.* Under review. (Preprint forthcoming.)
- Duwal, S., **Sharear Shopnil, M. N.**, Tyagi, A., & Proma, A. M. (2025). *Evidence-Grounded Multimodal Misinformation Detection with Attention-Based GNNs.* arXiv:2505.18221. Under review at ACL ARR (May 2025).
- Tafannum, F., **Sharear Shopnil, M. N.**, Salsabil, A., Ahmed, N., Rabiul Alam, M. G., & Reza, M. T. (2021). *Demystifying Black-box Learning Models of Rumor Detection from Social Media Posts. IEEE UEMCON.* https://doi.org/10.1109/UEMCON53757.2021.9666567

RESEARCH EXPERIENCE

Research Fellow, Fatima Fellowship   Sep 2024 – Present
- Designed an **agentic, multimodal** misinformation-detection pipeline that orchestrates LVLMs with web and reverse-image search to build *verifiable evidence graphs* and *traceable rationales.*
- Formalised *evidence* and *claim* graph representations; co-led development of a **cross-graph attention GNN** for image–text consistency scoring.
- Led experimental design and ablations (evidence weighting, encoder variants, graph topology), ran robustness checks and error analyses, and drafted the Methods/Results.
- Achieved **93.05%** accuracy on the evaluation set (**+2.82 pp** over the best LLM baseline); packaged code and configs for reproducible experiments.

PROFESSIONAL EXPERIENCE

AI Engineer, Technovative Solutions Ltd., Manchester, UK   Aug 2025 – Present
- **Lead architect for agentic AI across EU programmes** (*CLIMATEAdaptEOSC, EcoPlast*): designed planner–retriever–tool-use–evaluator loops that integrate LLM/LVM components with geospatial data pipelines and production MLOps.

- **Research mentorship and experimental rigor:** mentored 10 engineers on reproducible experiment design, systematic ablation studies, and causal analysis of model components; established lab-standard practices for hypothesis testing and failure-mode analysis.
- **Agentic AI architecture and interpretability:** deployed LLM-based planners with interpretable reasoning chains for climate adaptation and circular economy applications; built evaluation frameworks testing robustness to input perturbations and adversarial scenarios.
- **Circular-economy AI (EcoPlast):** developed hyperspectral classifiers for *black plastics*; built *physics-informed neural networks* to optimise solvent-based purification (SBP) of ELV GFRP parts for PP and long–glass fibre recovery; engineered optimisation workflows for enzymatic/chemical depolymerisation to recover monomers from ELV plastics.
- **Scaling and deployment:** fine-tuned and trained foundation models; delivered GPU-accelerated inference as containerised services (Docker; Kubernetes where appropriate) on on-prem *RTX A6000* servers with CI/CD, observability, and clean API endpoints for downstream applications.

Data Scientist, Faculty AI, London, UK   May 2024 – July 2024

- Delivered two production ML services for a client-facing ops platform (*L4*): a **Supplier Reliability Indicator** and a **Manufacturing Date Forecaster** to support proactive supply-chain planning.
- Built end-to-end pipelines: data validation and feature engineering; model selection with **XGBoost**, **LightGBM**, and **Bayesian Ridge**; time-aware validation and calibration; clear reporting for stakeholders.
- Deployed as secure **FastAPI** microservices (Dockerised) with scheduled updates, experiment/version tracking, monitoring, and a **failsafe fallback** to previous scores to ensure continuity.

SKILLS

- **Programming:** Python (PyTorch, NumPy, pandas), C++, SQL; API design and scripting.
- **LLMs & Agentic Systems:** Prompting & eval; **RAG**; fine-tuning (LoRA, RLHF/GRPO); **multimodal (VLMs)**; agentic workflows (planner–retriever–tool-use–evaluator); Hugging Face Transformers, LangChain.
- **Graphs & Networks:** Graph ML (GCN/GAT, link prediction); `PyTorch Geometric`, NetworkX; evidence-/occupation–skill graph modelling.
- **RL & ABM:** RL foundations (policy/value methods, bandits); Gymnasium/RLlib; agent-based modelling (concepts; prototyping in `Mesa`, `agentpy`).
- **ML/DL:** Supervised/unsupervised learning; representation learning (SimCLR); classical ML (XGBoost, LightGBM, scikit-learn); calibration & uncertainty estimation.
- **MLOps & Deployment:** Docker, CI/CD, testing, monitoring; FastAPI microservices; GPU computing; on-prem & cloud inference; experiment tracking (W&B/MLflow).
- **Data, Cloud & Databases:** PostgreSQL, MySQL, SQL Server; vector DBs (ChromaDB); AWS (EC2, S3), GCP (Compute Engine, Vertex AI), Azure (SQL, ML); distributed systems (basics).