MD Azizul Hakim

AI Researcher | Reinforcement Learning • Looped Language Models • Training & Inference Efficiency

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Research Interests

Reasoning efficiency in large language models: how training quality shapes test-time compute; reinforcement learning for reasoning (reward design for RL post-training); looped language models and adaptive computation depth; training and inference efficiency of LLMs.

Education

Diploma-in-Engineering in Computer Science and Technology **Jul 2021 – Feb 2026**
Bangladesh Sweden Polytechnic Institute CGPA: 3.40/4.00

Seeking fully funded BSc opportunities at international universities for 2026–2027 admission.

Publications

Top-Tier Conference — Sole Author

[1] Hakim, MD Azizul (2026). "Training Quality Determines Efficiency Boundaries in Test-Time Reasoning." *Advances in Neural Information Processing Systems* (**NeurIPS 2026, Main Track, Poster**). 50 models, 67,000+ evaluations, 6 benchmarks. [poster] [code]

Journal Articles

[J1] **Hakim, M.A.**, Uddin, M.S., & Anis, T.I. (2026). "Cross-Domain Generalization Failure in Lightweight Intrusion Detection Models for IIoT Networks." *Scientific Reports* (Nature Portfolio). **Accepted**. [arXiv] [code]

[J2] **Hakim, M.A.**, & Alam, M.I. (2025). "Biologically inspired neural network layer with homeostatic regulation and adaptive repair mechanisms." *Scientific Reports* (Nature Portfolio), 15. [paper] [code]

Conference Papers

[C1] **Hakim, M.A.**, Ifty, R.A., Delowar, K.E., Shuvo, S.A., Tasneem, Z., & Alam, M.I. (2025). "A Novel Neuroplasticity-Based Approach for Enhanced Generalization in Computer Vision." *IEEE QPAIN 2025.* [paper]

[C2] **Hakim, M.A.**, Ifty, R.A., Delowar, K.E., Chowdhury, S.H., Rashid, I., & Shakib, M. (2025). "NutriGuard: LLM-Driven Nutritional Assessment for Chronic Disease Prevention." *IEEE QPAIN 2025.* [paper]

[C3] **Hakim, M.A.**, Ifty, R.A., Delowar, K.E., Shuvo, S.A., Tasneem, Z., & Alam, M.I. (2025). "Neuroadaptive Intelligence: A Biologically-Inspired, Self-Repairing Neural Layer with Adaptive Learning for Molecular Graph Classification." *IEEE QPAIN 2025.* [paper]

Preprints

[P1] **Hakim, MD Azizul** (2026). "Brevity Constraints Reverse Performance Hierarchies in Language Models." *arXiv:2604.00025.* [arXiv] [code]

[P2] **Hakim, MD Azizul** (2026). "Multi-Scale Temporal Homeostasis Enables Efficient and Robust Neural Networks." *arXiv:2602.07009.* [arXiv] [code]

IEEE QPAIN: IEEE International Conference on Quantum Photonics, Artificial Intelligence & Networking.

Awards & Honors

NeurIPS 2026 Award — complimentary conference registration and hotel stay (Sydney) **2026**

2nd Runner-Up — AI Agent Development Competition (200+ teams) **2025**
Insten Company in collaboration with International Islamic University Chittagong (IIUC)

Kaggle Notebooks Master — kaggle.com/hakim11 **2024**

Technical Skills

Languages	Python, SQL, JavaScript, MATLAB, LaTeX
LLM Training	PyTorch, Hugging Face Transformers, TRL (GRPO), reward design for RL post-training
LLM Inference & Eval	vLLM, large-scale evaluation pipelines, test-time compute analysis
ML/DL	Scikit-learn, PyTorch Geometric, XGBoost, LightGBM, OpenCV
Compute & Tools	Kaggle, Modal (H200/B200 GPUs), Docker, Git, MLflow
LLM Applications	LangChain, LangGraph, CrewAI, RAG