Shady Ali

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LinkedIn | GitHub | Personal website | X/Twitter
Research interests: Interpretability, representation learning, and evaluation
Publications also appear under Shady Ali Said.

Education

University of Minnesota Twin Cities Sep 2024 - May 2026
B.S. in Computer Science, GPA: 3.968 Minneapolis, MN
Egypt University of Informatics Oct 2022 - Jul 2026
B.S. in Computer and Information Sciences, GPA: 3.90 Cairo, Egypt
Completed two bachelor's degrees through the EUI-UMN dual-degree program. Transferred after sophomore year; enrolled part time at UMN during junior year and full time during senior year, while remaining enrolled at EUI.

Publications and Manuscripts

* indicates my name; author names follow the original manuscripts.

Published, peer-reviewed

MotionCaution: Smartphone Application for Securing the Motions of Real-Time Vehicles
Mohammed Abdalla, Hoda M. O. Mokhtar, and **Shady Ali Said**[*]. 2025. Proceedings of Fourth International Conference on Computing and Communication Networks, Lecture Notes in Networks and Systems, vol. 1396, pp. 565-581. Springer.

Accepted manuscripts and workshop papers

PAIR: A Novel Large Language Model-Guided Selection Strategy for Evolutionary Algorithms
Shady Ali[*], Mahmoud Ashraf, Seif Hegazy, Fatty Salem, Hoda Mokhtar, Mohamed Medhat Gaber, and Mohamed Taher Alrefaie. arXiv:2503.03239, 2025. Accepted at the International Journal of Computational Intelligence Systems (IJCIS), Springer; publication pending fee-waiver funding.

Who You Test Matters: Difficulty Alignment in LLM Benchmark Analysis
Shady Ali[*] and Dongyeop Kang. 2026. Accepted for poster presentation at EvalEval, ACL 2026; not presented in person due to lack of travel funding.

Under review

Bringing Model Internals into Expert Annotation of Legal Reasoning
Shady Ali[*], Zae Myung Kim, Frank Schilder, and Dongyeop Kang. Under review at ICLR 2027.

In preparation

A Concept-Informed Item Response Model for Fine-grained LLM Evaluation
Shady Ali[*] and Dongyeop Kang. Manuscript in preparation, 2026.

Research Experience

University of Minnesota, MinnesotaNLP | Research Assistant Sep 2025 - Present
Minneapolis, MN | Advisor: Prof. Dongyeop Kang

- Developed an additive item response model using activation-derived semantic concepts. Improved response prediction and recovered MMLU-Pro model rankings using fewer questions than standard IRT or random selection; traced predicted shifts in correctness to concepts and activating tokens.
- Proposed inspecting smaller surrogate models to bring activation descriptions into expert annotation of legal reasoning with Thomson Reuters. Tested three models, finding stronger surrogacy within model families than across them; coordinated researchers and legal experts.
- Investigated how evaluated model populations change conclusions about benchmark quality. Proposed Capability Alignment Score (CAS), a Classical Test Theory-based information metric that was more stable with small model populations and selected smaller subsets that better preserved rankings.

Selected Research Projects

Transferring a JEPA-based ECG Foundation Model to EEG Apr 2026

Course project, CSCI 5527; team of two

- Reproduced an ECG Joint Embedding Predictive Architecture (JEPA) and transferred it to EEG motor-imagery classification. Reached 29.7% balanced accuracy on BCIC-IV 2a versus LaBraM's reported 28.5%, using approximately 480 hours of ECG pretraining versus 2,500 hours of EEG pretraining; fine-tuning datasets differed.

Self-Supervised Learning on ECG via Dual-Stream Transformers Nov 2025

Course project, Machine Learning for Healthcare

- Designed temporal and channel attention streams connected by bidirectional cross-attention. Found non-overlapping temporal partitioning outperformed noise-based augmentation.
- Investigated vanishing gradients in the temporal stream; channel-token dropout, residual gating, and auxiliary losses only slightly improved gradient flow.

Industry and Other Experience

Cogmenta Inc. | Machine Learning Engineer Minneapolis, MN | Sep 2026 - Present

- Build the central inference service used by the company's products and for internal development.
- Build a central connectors library that pulls data from outside services and providers into the company's products.
- Work on a rotation across product design, systems architecture, and hardware.

University of Minnesota | AI Technician Specialist Minneapolis, MN | Sep 2025 - May 2026

- Supported AI Makerspace operations and AI/ML prototyping.
- Deployed a slide-editing agent (NemoClaw, vLLM, quantized Qwen-3-Coder) on an NVIDIA DGX Spark for K-12 outreach, replacing a manual workflow to update 2,500+ legacy slides in four days.

Euclid Solutions | Intern Machine Learning Engineer Cairo, Egypt | Mar 2025 - Jun 2025

- Built a multithreaded Python, Pydantic, and Docker extraction pipeline for Workday (300K+ resumes) and Google Drive (20K+ files), using iterative LLM extraction and schema validation. Reduced turnaround from about two weeks to 3-4 days.
- Built a RAG pipeline using vLLM and PGVector/Postgres for candidate matching and outreach preparation; extended CrewAI's web-scraping tool with parameter controls, merged upstream.

Attijariwafa Bank | Intern Data Scientist Cairo, Egypt | Aug 2024 - Nov 2024

- Built a customer-retention proof of concept combining K-means/GMM segmentation with XGBoost and LSTM churn models (scikit-learn, PyTorch).

Honors and Scholarships

- 2026: High Distinction, University of Minnesota Twin Cities.
- 2026: Valedictorian, Egypt University of Informatics, class of 2026.
- 2024: Full scholarship through the EUI-Microsoft partnership (UMN dual-degree study); selected through EUI academic achievement, UMN transfer admission, and interviews.
- 2022: Full scholarship through the EUI-Microsoft partnership (undergraduate study at EUI), awarded for national entrance-exam performance.
- 2022: Ranked 11th nationally among more than 700,000 students in the Egyptian General Secondary Education Certificate (Thanaweya Amma).

Informal Student Mentoring

- Advised about five students on research opportunities, faculty fit and outreach, and connections with PhD students, including students referred by my EUI advisor. Helped two pursue enrollment at EUI and subsequently UMN.

Technical Skills

Languages: Python, C++

Methods: Item response modeling, sparse autoencoders, self-supervised learning, interpretability, LLM evaluation

ML/AI: PyTorch, vLLM, scikit-learn, Pydantic, Transformers

Tools and infrastructure: Docker, GitHub, PostgreSQL, AWS