

Daniel Agyei Asante

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RESEARCH INTERESTS

- Efficient and Trustworthy LLMs (Compression, Alignment, Interpretability, Inference optimization)
- Agentic LLM Systems (Tool Calling, Planning, Long-Context Reasoning, Workflow Execution)
- Natural Language Processing (Evaluation Benchmarks, Fact-Checking, Retrieval-Augmented Generation)

EDUCATION

Iowa State University, United States

01/24 – 06/27 (expected)

PhD. Computer Science (CGPA: 4.0/4.0)

University of Cape Coast, Ghana

08/18 – 09/22

BSc. Computer Science (CGPA: 3.98/4.0)

WORK EXPERIENCE

Iowa State University

01/24 – Present

Research Assistant

- Lead research on scalable LLM compression, parameter-efficient fine-tuning, and agentic capabilities.
- Develop an evaluation framework for privacy, adversarial robustness, alignment, and jailbreak resistance in large language models.

Iowa State University

01/24 – 05/25

Teaching Assistant

- Served as lab instructor for Java, C, and C++ programming courses.
- Graded assignments and examinations, providing feedback to improve student performance.

Sage Microsystems

06/23 – 12/24

Software Developer

- Developed cross-platform application ([MVI tracking](#)) using Flutter, Dart, and Python.
- Designed and integrated APIs to enable real-time device tracking, geolocation services, and live data synchronization in a production-deployed cross-platform application.

PUBLICATIONS

* indicates equal contribution

Daniel Agyei Asante, Ernie Chang, Yang Li, "Importance-Guided Basis Selection for Low-Rank Decomposition of Large Language Models", submitted to *Conference on Neural Information Processing Systems (NeurIPS)*, 2026.

Daniel Agyei Asante, Md Mokarram Chowdhury, Yang Li, "Decomposed Trust: Exploring Privacy, Adversarial Robustness and Ethics of Low-Rank LLMs", *Association for Computational Linguistics (ACL)*, 2026.

Md Mokarram Chowdhury, **Daniel Agyei Asante**, Ernie Chang, Yang Li, "IMPACT: Importance-Aware Activation Space Reconstruction", *Association for Computational Linguistics (ACL)*, 2026.

Yang Li*, **Daniel Agyei Asante***, Changsheng Zhao, Ernie Chang, Yangyang Shi, Vikas Chandra, "Streamlining Language Models via Semantic Basis Analysis", *Transactions on Machine Learning Research (TMLR)*, 2025.

Daniel Agyei Asante, Mark Tetteh, Regina Esi Turkson, Lucy Manu Agyei, Obadiah Denteh Asare, "Predicting Electricity Market Price Using Machine Learning and Quantifying Dependency Beyond Renewable Energy", *IEEE International Conference on Sustainable Technology and Engineering (IEEE-ICOSTE)*, 2024.

KEY PROJECTS

Importance-Guided Basis Selection for Low-Rank Decomposition of Large Language Models 11/25 – Present

- Proposed BSI, a loss-aware low-rank compression method that ranks SVD bases by their estimated impact on model loss.
- Designed an efficient Hessian-diagonal estimator for LLMs using stochastic gradient perturbations.

Preserving the Agentic Capabilities of LLMs 08/25 – Present

- Built a large-scale evaluation pipeline to measure and analyze the agentic capabilities of large language models across several agentic subsystems.
- Conducted the first systematic evaluation of how model compression affects LLM agent capabilities across tool use, workflow execution, long-context reasoning, and interactive environments.
- Conducted interpretability analysis to identify circuits and basis components associated with LLM agentic capabilities.

Decomposed Trust: Exploring Privacy, Adversarial Robustness and Ethics of Low-Rank LLMs 05/25 – 03/26

- Designed and conducted comprehensive trustworthiness evaluation of large language models.
- Investigated how fine-tuning strategies and model scale influence privacy leakage, ethical behavior, fairness, jailbreak susceptibility, and robustness in large language models.
- Conducted interpretability and explainability analysis using gradient attribution to identify critical components in LLMs affecting model trustworthiness.

Streamlining Language Models via Semantic Basis Analysis 12/24 – 11/25

- Proposed Basel, a novel algorithm for compressing large language models by streamlining basis semantics after decomposition.
- Integrated post-training quantization with Basel to analyze compression and accuracy trade-offs under combined techniques.
- Developed a custom HuggingFace-style Trainer and compression-aware model architecture to improve efficiency and reduce computational and memory overhead.

HONORS & AWARDS

- **Phi Kappa Phi Honor Society, Iowa State University**, for Academic Excellence 2026
- **University of Cape Coast, Valedictorian of the 55th Congregation** 2022
- **Dean's Excellence Award, University of Cape Coast, Ranked 1/905 in the senior year** 2022
- **Dean's Excellence Award, University of Cape Coast, Departmental Best Student** 2019 – 2021

TECHNICAL SKILLS

- **Programming:** Python (primary), Java, C/C++, Dart, JavaScript, SQL
- **Large Language Models & Agent Systems:** LLM Fine-Tuning, RAG Systems, Agentic Orchestration, LLM Tool Calling, Latent Reasoning, Multi-step Planning, Evaluation Pipelines, Model Context Protocol (MCP), Hugging Face Transformers, LangChain
- **ML Systems & Training Infrastructure:** PyTorch, TensorFlow, Distributed Training (DeepSpeed, DDP, FSDP), FlashAttention, CUDA, vLLM, GPU Optimization, Mixed Precision Training, Inference Optimization, High-Performance Computing, Reinforcement learning, Influence function for fine-tuning
- **Deployment & Production ML:** FastAPI, REST APIs, Containerization (Docker), Linux, AWS, GCP, Model Serving, Experiment Tracking
- **Data Science & Analytics:** Pandas, NumPy, Scikit-learn, Feature Engineering, Statistical Modeling, Matplotlib, Seaborn
- **Relevant Courses:** Advanced Topics in Machine Learning, Advanced Topics in Artificial Intelligence, Data Structures, Advanced Algorithms, Numerical Analysis, Software Engineering, Database Management, Computer Architecture, Operating Systems, Theory of Computation.