Twumasi Mensah-Boateng
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EDUCATION

University of North Texas, *Denton, TX*
Ph.D. Computer Science and Engineering   **01/2023 - *expected* 12/2026**

Research Focus: Submodular Optimization in Machine Learning and Artificial Intelligence, Autonomous Agents, Active Learning, Large Language Models, Prompt Engineering.

Kwame Nkrumah University of Science and Technology, *Kumasi, Ghana*
BSc. Electrical/Electronic Engineering   **08/2017 - 09/2021**

TECHNICAL SKILLS

Software: Git, Microsoft Office Suite, Jupyter notebooks, Huggingface Transformers, Pytorch, Vim, Bash, Docker, Google Cloud Platform, Gradio, Cursor, VScode, Claude Code.
Programming Languages: Python (Advanced), MATLAB (Advanced), C/C++ (Intermediate).
Operating Systems: Windows, Linux.
Soft skills: Academic writing, Presentation skills, Teaching, and Implementing research papers.
AI Skills: LLM Fine-tuning, Prompt Engineering, Autonomous Agents, Multimodal Models, RAG.

RESEARCH/WORK EXPERIENCE

Graduate Research Assistant   **01/2023 - Date**
Robust Adaptive Learning Lab, Computer Science and Engineering, University of North Texas

- **Submodular & Adaptive Optimization:** Designing novel algorithms for data subset selection and active learning, reducing computational and data requirements while extending applications into domains such as education and software engineering.
- **LLM-Based Agents & Simulations:** Developing multi-agent systems that model real-world game-theoretic interactions, reducing the need for human subjects and enabling scalable, ethical research.
- **Dataset Curation & Applied AI:** Creating high-quality datasets for LLMs in data-scarce fields and building robust AI frameworks and algorithms to accelerate solutions to traditional problems.

Intern, SRI International   **05/27/2025 - 07/18/2025**
Delivered impactful results across 3 major research projects in just 8 weeks, demonstrating exceptional productivity and technical versatility in AI/ML applications for education and crisis response.

- **Advanced AI/ML Implementation**: Developed multiple AI-powered frameworks using cutting-edge APIs (Gemini, OpenAI, YouTube) with measurable success - achieved 90% agreement with human annotators across 70+ classification categories
- **Full-Stack Development & Cloud Deployment**: Built and deployed scalable applications end-to-end using modern tech stack (Docker, Google Cloud Platform, Gradio) with proven performance improvements.
- **Research Impact Across Diverse Domains**: Contributed to funded research spanning K-12 crisis response, early childhood education (Gates Foundation), and curating education videos.
- **Custom Tool Development**: Engineered specialized solutions including RAG systems with multi-agent architecture, video segmentation tools, and PDF-to-markdown conversion pipelines that outperformed commercial alternatives.

- **Rapid Learning & Execution**: Mastered multiple APIs, frameworks, and deployment platforms while delivering production-ready applications in an accelerated 8-week timeline.

Intern, SRI International   **10/06/2025 – 12/19/2025**
CSL Intern
- Developing multi-agentic framework suitable for complex workflows.
- Developing and evaluating relevant machine learning frameworks.
- Documenting research ideas for an upcoming academic publication.

PUBLICATIONS

- S. Cai, **T. Mensah-Boateng**, X Kuksov, J Yuan, S Tang, "The Power of Adaptation: Boosting In-Context Learning through Adaptive Prompting" CAIA 2025, doi: [link](#)

- J. Yuan, **T. Mensah-Boateng**, and S. Tang, "Influencer Marketing Augmented Personalized Assortment Planning: A Two-Stage Optimization Problem," ICWSM, vol. 18, pp. 1753-1765, May 2024, doi: [link](#)

- S. Tang, J. Yuan, and **T. Mensah-Boateng**, "Achieving Long-Term Fairness in Submodular Maximization Through Randomization," in Graphs and Combinatorial Optimization: from Theory to Applications, vol. 13, pp. 161–173. doi: [link](#)

ONGOING RESEARCH PROJECTS

Accessibility-Focused LLM Coding Assistants: Creating a systematic data curation framework to compile and structure accessibility-focused training datasets, enabling effective fine-tuning of Large Language Models to generate WCAG-compliant web code without requiring specialized prompting.

Submodularity in Education: Investigating submodular function properties to design adaptive data curation systems that provably optimize educational dataset composition, addressing critical challenges in educational research data selection and preprocessing workflows.

LLMs for Algorithm Design: Developing frameworks where Large Language Models generate, refine, and evaluate novel algorithmic strategies by combining classical paradigms such as heuristics, evolutionary methods, and optimization techniques.