Fahad Nadim Ziad

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EDUCATION

BRAC University Dhaka, Bangladesh
Bachelor of Science in Computer Science *Expected Graduation: February 2026*
CGPA: 3.73 / 4.0 *(Merit Scholarship Recipient)*

Thesis: *A Transformer-Based Framework for Cross-Modal Attention and Explainability in Neuro-degenerative Assessment*
Specialization: Artificial Intelligence & Machine Learning; Bioinformatics; Natural Language Processing
Relevant Coursework: Bioinformatics I; Natural Language Processing II; Machine Learning; Artificial Intelligence; Image Processing; Pattern Recognition; Data Science; Operating Systems; Algorithms; Data Structures.

Research & Projects

A Transformer-Based Framework for Neuro-degenerative Assessment | *Project Lead B.Sc. Thesis (Phase 2 passed; Phase 3 in progress)*

- Architecting and leading the development of a novel, modality-aware **Transformer** framework to diagnose neurodegenerative diseases (AD, PD, MS) from multi-modal neuroimaging data (EEG, fMRI, sMRI).
- Pioneering a "modality dropout" aware training scheme to build a system robust to the real-world challenge of incomplete clinical data.
- Integrating a dual-level explainability framework using **SHAP** for modality-wise contribution and attention maps for region-wise anatomical interpretation.

BioAlign-QLoRA: Biomedical Knowledge Graph Alignment | *Project Lead* *CSE443: Bioinformatics*

- Led a team research project developing a novel **Knowledge Graph Separation methodology** for quantifying structural alignment of LLM embeddings with biomedical knowledge graphs following QLoRA fine-tuning.
- Architected and implemented QLoRA fine-tuning pipeline for Llama-3, Mistral-7B, and Phi-3 models using curated CTD dataset (68,444 gene-disease pairs). Achieved **83.8% accuracy** with Mistral model, outperforming pre-trained BioMistral-7B expert.
- Demonstrated **126% improvement** in embedding geometric alignment with Phi-3 Mini, validating lightweight model viability for resource-constrained biomedical AI deployment.

Mini-VSFS: Virtual File System Implementation | *Solo Developer* *CSE321: Operating Systems*

- Single-handedly designed and implemented a complete virtual file system from scratch featuring custom superblock management with CRC32 checksums and Unix-style inode system (128-byte inodes).
- Built comprehensive bitmap-based allocation tracking, direct block addressing supporting up to 12 blocks per file, with robust error handling and data integrity validation for educational file system concepts.

Enhancing Recession Prediction with XAI | *Independent Researcher* *CSE424: Pattern Recognition*

- Conducted a solo project developing a stacking ensemble model that achieved **96% accuracy and 100% recall** in forecasting U.S. recessions.
- Single-handedly constructed the entire dataset by integrating data from over 15 public sources, and used **SHAP** to interpret the model and validate its economic logic.

CampusCompanion: Full-Stack University Platform | *Project Lead* *CSE470: Software Engineering*

- Led the development of a comprehensive university platform with **React, TypeScript, and Tailwind CSS**, featuring course resource management, resume builder, collaboration hub, and job opportunities.
- Implemented MVC architecture with **TypeScript interfaces**, role-based access control, and responsive design with dark/light mode themes.
- Deployed on **Vercel** platform with streamlined deployment process. Platform includes resource sharing, study collaboration tools, and career development features.

Demystifying Exoplanet Habitability with XAI | *Project Lead* *CSE427: Machine Learning*

- Led a research project to classify exoplanet habitability, achieving **99.93% accuracy** with a LightGBM model by using the SMOTE technique to handle severe class imbalance and **LIME** for interpretability.

Gamified Mobile Banking Adoption Analysis | *Project Lead* *CSE437: Data Science*

- Led a research study on FinTech user behavior, applying statistical tests (ANOVA, Chi-Square, Regression) in Python to analyze survey data and derive actionable insights on gamification in mobile banking.

Leadership & Experience

Sub Executive, Marketing & PR | BRAC University Business Club 2022 – 2024
- Executed multi-platform digital marketing campaigns to promote club events, significantly increasing student attendance and online visibility.

Senior Executive, Business Development | IABC | BRACU 2022 – 2023
- Organized Model UN events, led club promotion initiatives, and managed member recruitment drives.

Junior Executive, Research & Project Management | Robotics Club of BRAC University 2022 – 2023
- Participated in foundational engineering workshops and contributed to project planning for competitive technical festivals.

Apprentice, Communications | BRAC University Film Club 2022 – 2023
- Hosted and emceed club events, including film screenings and workshops, facilitating audience engagement and leading post-screening educational discussions.

Vice President | Willes Science Club 2017 – 2019
- Led planning and execution of large-scale science and IT events, mentoring junior members and coordinating educational workshops.

Technical Skills

- **Programming:** Python, C/C++, JavaScript, TypeScript, SQL, LaTeX
- **ML/AI:** PyTorch, TensorFlow, Transformers, QLoRA, SHAP, LIME, Scikit-learn
- **Web:** React, Node.js, Flask, MySQL
- **Tools:** Git, Docker, Linux, Jupyter, VS Code
- **DevOps:** CI/CD (GitHub Actions), Version Control (Git), Automated Workflows
- **Academic:** Research Methodology, Statistical Analysis, Technical Writing

Languages

Languages: English (Fluent, IELTS: 7.5), Bangla (Native), Hindi & Urdu (Conversational)

Awards & Recognition

Model UN & Leadership
- Outstanding Delegate, BUPIMUN 2023
- Special Mention, NDCMUN 2020 & EMUNGA'21
- Verbal Mention, NDCMUN 2018
- 2nd, Extempore Speech, Technobit 2.0

Academic Competitions
- 1st, ECO Vocabulary, NDC Summit 2017
- 1st, ECO Vocabulary, ACC National Carnival 2018
- 1st, Geek Olympiad, WSC Convening 2017
- 2nd, General Knowledge, WSC Convening 2017

Science & Project Fairs
- 2nd, Project Display, ACC Science Fest 2017
- 3rd, Project Display, Willes Science Fest 2015
- 3rd, Nature Study, ACC Science Fest 2017
- Consolation, 9th SGHSC Science Fest 2017

Creative & Cultural
- 3rd, Story Writing, WSC 2017
- 1st, Quran Recitation, WLFSC Fest 2016

Core Competencies

- **Teaching & Communication:** Experience in hosting events, facilitating discussions, and presenting complex technical concepts
- **Leadership:** Proven track record in team leadership across multiple student organizations
- **Problem-Solving:** Strong analytical thinking demonstrated through research projects
- **Mentoring:** Experience guiding junior members in technical projects and research activities

Research Interests

Machine Learning in Healthcare, Bioinformatics, Natural Language Processing, Computer Vision, Systems Programming, Explainable AI (XAI)

Last updated: November 9, 2025