Sudmun Hakim Soudho

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PROFILE STATEMENT — Motivated and detail-oriented Computer Science graduate with a strong passion for Reinforcement Learning, Natural Language Processing, and Large Language Models. Enthusiastic about exploring advanced research areas including Multi-Agent Reinforcement Learning, LLM alignment, and emerging topics in AI. Skilled at deep-diving into complex problems, combining rigorous theoretical understanding with hands-on experimentation to drive innovative solutions. Open to learning and mastering new technologies and methodologies, with a commitment to staying at the forefront of cutting-edge developments in machine learning and artificial intelligence.

Skills

AI and ML tools	PyTorch, TensorFlow, Keras, Scikit-learn
Problem Solving	Solved 450+ problems on various online judges (Codeforces, AtCoder)
Others	Wireshark, Flex (Yacc/Bison), OpenGL, Packet Tracer
Languages	Python, C, C++, Java
OS	Windows, Mac, Ubuntu
Database	MySQL
Web-Dev	HTML, CSS

Experience

BRAC UNIVERSITY **November 24 – May 25**
Undergraduate Teaching Assistant– Complex Variables & Laplace Transformations

- Provide academic consultation and mentoring to students enrolled in MAT-215, supporting their understanding of key concepts in this course.
- Grade assignments and deliver personalized feedback to help students strengthen their logical reasoning and analytical skills.
- Assist faculty members in managing course logistics and responding to student inquiries.
- Help maintain a productive and supportive academic environment within the department.

Education

Brac University
Bachelor of Science in Computer Science *October 2025*
CGPA: 3.901
Only CSE Courses & Undergraduate Thesis — ***CGPA: 3.96***
Final 4 Semesters — ***CGPA: 3.98***

Cantonment Public School and College, Rangpur **2019**
Higher Secondary Certificate (HSC) *GPA: 5.00/5.00*

Cantonment Public School and College, Rangpur **2017**
Secondary School Certificate (SSC) *GPA: 5.00/5.00*

Undergrad Thesis and Research Projects

Optimising Margin based Portfolio Management through Deep Reinforcement Learning **Undergrad Thesis**

- Collected and preprocessed historical stock data for all Dow 30 tickers (Jan 2009–Apr 2020) from Yahoo Finance, computing technical indicators (e.g., RSI, SMA, CCI) and market signals (VIX, turbulence) for enriched state features.
- Implemented a Transformer-based DRL architecture: used multi-head attention (8–16 heads) for temporal and cross-asset feature extraction in a PPO framework, and deployed five specialized agent strategies (profit maximizer, momentum, trend, mean-reversion, volatility) for diversified decision-making.

- Integrated realistic margin-trading constraints (dynamic leverage ratios, maintenance margin requirements, borrowing limits) into the trading environment and engineered a multi-objective reward function balancing profit maximization, risk-adjusted returns, drawdown minimization, and margin efficiency.
- Achieved superior backtested performance: enhanced model delivered significantly higher risk-adjusted returns and reduced drawdowns.

Stock Price Prediction using Deep Learning **CSE427: Machine Learning - BRAC University**

- Collected and preprocessed over 20 years of Apple Inc. (AAPL) historical stock data from Yahoo Finance, integrating technical indicators for time-series modeling.
- Implemented and trained LSTM, Bidirectional LSTM (BiLSTM), and AdaBoost models to predict stock closing prices and market movement direction.
- Applied a sliding window approach for sequence generation, normalized data, and tuned hyperparameters for optimal model performance.
- Achieved highest performance with BiLSTM (RMSE = 12.04, MAE = 9.50, R^2 = 0.90), outperforming other models in capturing temporal dependencies.

Night Vision: Footage Enhancement and Colorization using Hierarchical Transformer Architecture **CSE463: Computer Vision - BRAC University**

- Engineered a Hierarchical Transformer model combining ViT-32 encoder with progressive deconvolution decoder to automatically enhance and colorize night vision footage while preserving structural integrity and semantic accuracy.
- Curated specialized ImageNet dataset (40,000 training images) and designed composite loss function balancing perceptual, color-consistency, and edge-preservation objectives for low-light enhancement.
- Achieved superior results (Colorfulness: 39.33) compared to state-of-the-art methods; optimized for real-time deployment in security and autonomous systems

Web Development Projects

Online Food Order Service **February 2024**

- Developed a web-based food ordering platform with secure user authentication (sign-up/login), dynamic restaurant menu browsing, food customization, and cart management.
- Implemented using PHP, MySQL, HTML, and CSS, integrating real-time order management for efficient restaurant-customer interaction.

Achievements & Certifications

- **BRAC University** – **Secured the 19th Position** at the start of Summer 25 semester through competitive selection in written Student Tutor screening among **300 candidates** shortlisted from **700+ applicants** based on CGPA and credentials. 2025
- **BRAC University** — Highest Distinction 2025
- **BRAC University** — Merit Scholarship Based on Academic Results 2024, 2025
- **BRAC University** — Vice Chancellor's Honour List **(3 times)**
- **BRAC University** — Dean's Honour List **(2 times)**
- **Datacamp** — Completed several courses on Data Science and Image Processing 2024
- **BRAC University** — Participated in BRACU Intra University Programming Contest 2022

Extracurricular Activities

General Member, Event Management Team **BRAC University Computer Club**

- Coordinated logistics and on-site execution of seminars and workshops for BUCC events.
- Collaborated with club officers to plan marketing and outreach activities.

Interhouse Cricket Team **School & College**

- Played for both school and college interhouse cricket teams; served as Vice Captain in college.
- Led the school team to the championship title.

Science Fair Participant **Primary School**

- Participated in the annual science fair in class 5, presenting a project on basic physics demonstrations.

References

Dr. Farig Sadeque
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