Riad Mahmud Chowdhury

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CAREER OBJECTIVE

My goal is to expand my research and technical capabilities in Data Science, Machine Learning (ML), and Cybersecurity across the end-to-end data lifecycle—from data preprocessing and exploratory analysis to online learning and model deployment. Building upon my prior research in game-theoretic moving-target defense and cyber-physical network security, I aim to develop robust, scalable defense algorithms while investigating methods to make machine learning workflows more energy-efficient and environmentally sustainable.

RESEARCH INTERESTS

Machine Learning (ML), **Data Science**, **Cybersecurity** (Cyber-Physical Systems Security, Moving-Target Defense, Online Convex Optimization & Game Theory, Energy-Efficient ML)

EDUCATION

Nantong University, School of Artificial Intelligence and Computer Science — **Nantong, Jiangsu, China**
Bachelor of Science Degree in Computer Science and Technology — 2023.09.10 – Present (Exp. 2027)
CGPA: **4.00** (Completed 6th Semester / 144 Credits)

Chattogram Bandar College — **Chattogram, Bangladesh**
Higher Secondary Certificate (HSC) in Science — 2018 – 2020
Result: GPA: **4.87 / 5.00**

Mandarin Language Proficiency (HSK Level 4) — **Nantong University, China**
Result: **220 / 300** — 2025.12

SKILLS SUMMARY

- **Programming:** Python, R, JavaScript, C#, Java, SQL, HTML/CSS
- **Data Science & AI/ML:** Machine Learning, Online Convex Optimization (Entropic Mirror Descent), Parametric Linear Programming (LP), Game-Theoretic Modeling, Statistical Hypothesis Testing (χ^2 Detector), Exploratory Data Analysis (EDA), Pandas, NumPy, Scikit-learn, Matplotlib, Plotly, Tidyverse, Ggplot2
- **Tools & Platforms:** pandapower, SciPy / LP Solvers, Visual Studio Code, Google Colab, Jupyter Notebook, Git, GitHub, LaTeX, RStudio, Zotero, Microsoft Office
- **Languages:** Bengali (Native), English (Advanced / Fluent), Mandarin (Intermediate)

CONFERENCE PUBLICATIONS

- **International Conferences:**
  - **[IEEE CSDE'26]:** Md Mostofa Nurannabi Shakil, **Riad Mahmud Chowdhury**, Tanvir Hossain, Md. Alamgir Hossain, Md. Samiul Islam, and Md. Shafiqul Islam, "Provable Moving-Target Defense for Cyber-Physical Networks: From the Security–Performance Frontier to No-Regret Defense," in Proceedings of the 12th IEEE Asia-Pacific Conference on Computer Science and Data Engineering (IEEE CSDE 2026), Cox's Bazar, Bangladesh, November 1–3, 2026. [Accepted].

RESEARCH EXPERIENCE

Research Contributor & Co-Author (Cyber-Physical Systems & Data Analysis) — IEEE CSDE 2026

- **Experimental Modeling & Simulation:** Instantiated and validated a game-theoretic Moving-Target Defense (MTD) framework on **IEEE 14-bus (34 measurements)** and **IEEE 118-bus (304 measurements)** power grids using pandapower across **12 D-FACTS reactance configurations** (±60% range).
- **Security & Optimization Analysis:** Evaluated False-Data-Injection (FDI) stealth against DC Weighted-Least-Squares (WLS) state estimation and χ^2 residual detectors (5% false-alarm rate), empirically estimating confusion kernels (K) and validating parametric Linear Programming (LP) security–cost frontiers.
- **Algorithmic Evaluation & Scalability Impact:** Benchmarked entropic online mirror descent achieving sublinear $O(\sqrt{T \log N})$ regret over 6,000 epochs and demonstrated favorable grid scalability by reducing off-diagonal attack stealth from **0.14 to 0.04** and lowering the matrix-game security floor val(K) from **0.21 to 0.13**.

PROJECTS & SOFTWARE DEVELOPMENT

• [Banking-Web-C-] Online Banking Web System Dec 2025

Architected a secure full-stack web application using C# implementing robust object-oriented transaction logic, customer account management, and relational database connectivity. Enforced backend data integrity, input validation, and modular architecture for reliable financial operations.

• [lego-data-analysis] Multi-Decade Structural Dataset Insights 2026

Analyzed **15,710 LEGO sets** (1949–2021) and **596 themes** in Python (Pandas, Matplotlib) by merging relational schemas. Identified **135 unique colors** (107 opaque, 28 transparent), quantified an **18× surge in set complexity** from **12.36 average parts** (1954) to **221.84 parts** (2017; peaking at 9,987 parts), and established Star Wars as the top franchise with **753 sets**.

• [StackOverflow-Language-Trends] Developer Adoption Analytics 2026

Built a time-series pipeline in Python (Pandas, Matplotlib) using SQL-extracted StackExchange data (**1,991 monthly records** across **14 programming languages**, 2008–2020). Applied pivot tables and 12-month rolling-mean smoothing, revealing **JavaScript** as the cumulative all-time leader (**2,056,510 posts**) while demonstrating **Python's** rapid trajectory to **#1 monthly active language** (~34,478 posts/month by 2020).

• [college-salaries-analysis-pandas] Post-Graduation Compensation Modeling 2026

Evaluated PayScale compensation data across **50 undergraduate majors** categorized into STEM, Business, and HASS using Pandas. Identified Physician Assistant as the top starting major (**$74,300**), Chemical Engineering as the highest mid-career median earner (**$107,000**), Nursing as the lowest-risk career (**$50,700** 10th–90th percentile spread) vs. Economics with the highest upside (**$210,000** 90th percentile), and proved **STEM majors** lead in group-level mid-career median pay (**$90,812.50**).

• [Superstore-Sales-Profitability-Analysis] Enterprise Retail Analytics 2026

Engineered a modular R analytics workflow (01_clean_the_dataset.R, 02_superstore_analysis.R using Tidyverse & Ggplot2) to transform raw retail records into cleaned datasets and automated visual/tabular reports. Quantified sub-category profit/loss margins, regional shipping mode costs, order priority revenue distributions, and customer segment discount sensitivity, uncovering how aggressive discounting erodes net profitability.

CERTIFICATIONS & PROFESSIONAL TRAINING

• Data, Data, Everywhere — Google Data Analytics Professional Certificate Coursera | 2026

Credential: Certificate Verification Link [Verified / Completed]

• 100 Days of Code: The Complete Python Pro Bootcamp Udemy | 2026

Credential: Certificate Verification Link [Verified / Completed]

ACADEMIC HONORS & EXTRA-CURRICULARS

- **Perfect Academic Standing (CGPA 4.00 / 4.00):** Ranked in top tier throughout all completed semesters at Nantong University, School of Artificial Intelligence and Computer Science (2023 – Present).
- **Academic Mentorship:** Assisted peer student groups in scientific Python environments, structured notebook practices, and data visualization setups.

ACADEMIC REFERENCES

Xiaolin Ju
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