

JUNBUM CHO

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EDUCATION

Avon Old Farms School Sep 2022 - Present
University of Pennsylvania, *Pre-baccalaureate Data Science Camp* July, Aug 2024

HONORS & AWARDS

Community Service Pin (100+ Service Hours) Nov 2025
Head of School List Award (GPA of at least 3.80) May 2023, May 2024, May 2025
Brown University Book Award May 2025
Excellence in Multivariable Calculus (Highest Grade) May 2025
Bausch and Lomb Honorary Science Award May 2025
Academic Excellence Award (Top GPA among 10th grade) May 2024
Excellence in AP Calculus BC (Highest Grade) May 2024
Leadership Pin (Environment Initiatives as Club Leader) May 2024
National Latin Exam, (*Intermediate Reading Comprehension Certificate of Merit*) Feb 2024
Korea Code Fair (National Software Competition) Finalist Jun 2024 - Oct 2024
International Youth Mathematics Competition (IYMC) Finalist Oct 2023 - Nov 2023
3rd Korea Institute of Music Prodigy Concours (First Prize, Clarinet Division) July 2022
21st National Student Music Scholarship Concours (First Prize, Clarinet Division) Apr 2021

DATA SCIENCE / AI / RESEARCH RELATED ACTIVITIES

Research Publication on Enhancing LLM Specialization Through Deep Learning, Author Mar 2025 - June 2025

- Designed a DL-LLM Modular System that integrates a customized Deep Learning model with large language models to improve on-device reasoning, classification accuracy, and few-shot efficiency. Demonstrated reduced latency and server dependency across multiple frontier LLMs by 21.5% through modular task allocation and optimized audio data processing.
- Published work in the *National High School Journal of Science (NHSJS)*:
<https://nhsjs.com/2025/enhancing-reasoning-efficiency-and-domain-adaptability-of-server-linked-llms-by-combining-with-a-customized-deep-learning-model/>

Research Publication on LLMs Performance in Financial Bubble Prediction, Author June - September 2025

- Pioneered LLM application for financial bubble prediction using quantitative macro-financial data. First to extend beyond the conventional text-based sentiment methods. Conducted rigorous performance comparison across traditional deep learning models, LLMs, and hybrid architectures, providing insights for future research.
- Published work in the *NHSJS*:
<https://nhsjs.com/2025/assessing-the-possibility-and-feasibility-of-predicting-major-us-financial-bubbles-using-deep-learning-llm-and-dl-llm-architectures-analyzing-macro-financial-data/>

Research Paper on AI Performance for Post-IPO Stock Volatility Prediction, Author August - October 2025

- Applied LLMs and Deep Learning to predict post-IPO volatility in the U.S. stock market during M2 contraction periods. First to identify this volatility pattern and benchmark AI model performance under these macroeconomic conditions.
- The research paper is currently under peer review at the *National High School Journal of Science (NHSJS)*.

Crime Detection Software ("Autone"), Developer/Creator July 2023 - June 2024

- Developed an AI-driven app, "Autone," that uses audio machine learning algorithms to detect crime and analyze data, increasing law enforcement response by 9.09%.

- Integrated real-time data from local police databases, enhancing the app's predictive and reliability; incorporated real-time alerts and visual crime maps, increasing user retention by 15%. Won Top 10 on Korea Code Fair (KCF), Korea's National Software Competition affiliated with ISEF.

UPenn Pre-baccalaureate Statistics & Data Science Program, Participant May, June 2024

- Engaged in hands-on sessions learning Exploratory Data Analysis, a method of identifying patterns and anomalies, and collecting initial observations in various datasets. Primarily utilized Python, accompanied by semi-real-world datasets such as stock data from Yahoo Finance.
- Learn the basics of data collection, cleaning, and analysis methods with a professional Data Science professor. Experience 6.5% more accuracy in selecting successful stock choices based on the concepts taught.

EXTRA CURRICULAR / ENTREPRENEURSHIP ACTIVITIES

Centralized Platform for School Athletics & Spirit ("AOF Athletics"), Developer/Creator June 2024 - Dec 2024

- Designed and launched an athletics logistics app for Avon Old Farms School and the Founders League (athletic league of 13 CT & NY preparatory schools), streamlining team scheduling and real-time match updates. Available on Apple App Store: <https://apps.apple.com/us/app/aof-athletics/id6593683974> Available at Google Play Store: <https://play.google.com/store/apps/details?id=com.mycompany.foundersleague>
- Secured a partnership with Veracross (School Information System Vendor) to implement secure data synchronization, enhancing school management efficiency and app adoption. Presented to the Board of Directors, Principal, and administrative staff. Operates with 380+ users, 45m avg engagement, and 31K+ screen views; Founded as a non-profit for long-term management.

Common Computer (South Korean Software Company), Intern June 2025 - July 2025

- Independently researched emerging Web 3.0 technologies; created educational posts via social media (@ainetwork_ai); led Web3 AI Lab sessions; translated complex Web 3.0 concepts into accessible content.
- Contributed foundational research to the company's AIFEL project; integrated autonomous AI agents with Web3 protocols, including MCP (Model Context Protocol), A2A (Agent-to-Agent), and mem0.

Research on Drug Analysis against Antifungal Resistance Apr 2024 - Present

- Investigate the molecular interaction between a fungal pathogenic protein and its inhibitor using a range of bioinformatics tools and structural analysis techniques; collaborated with a college professor and the school's biology instructor. (https://drive.google.com/file/d/139AqODQG-IL_9dhxMCHjRjkY1f_92vrM/view)
- Aiming for publication in American Biology Teachers (ABT), a peer-reviewed professional journal for K-16 biology teachers.

Applied Math Club, Co-Head Sep 2023 - Present

- Organized problem-solving workshops and competitions, achieved top ranks in math contests, including IYMC.
- Introduced a peer-mentorship program that increased members' problem-solving skills, leading to higher overall math grades among participants.

Environmental Club (Campus-wide sustainability initiatives), Co-Head Sep 2023 - Present

- Led food waste management initiatives, reducing food waste by 13.3% in September 2024; awarded leadership pin for outstanding club leadership.
- Collaborated with the school's Nimrod Club (Environmental Conservatory Club) and local farm to initiate campus-outreach activities, particularly reutilizing leftover food waste as food sources for the cattle of the farm.

Personal Website, Creator June 2022 - Present

- Developed a personal website (junbumcho.com) showcasing 5 years of 12+ technical projects and 100+ service hrs. Attracts 1.5k views/mo and serves as a digital resume for networking. Sent to 15+ institutions.
- Continuously updated the site with new content, transforming it into a comprehensive visual resume and teaching platform that highlights my technical skills and dedication to continuous learning.