Patton Lai Xi Nai

+(1) 347 468 4442 | johnbean393@gmail.com | GitHub

EDUCATION

New York University **New York, NY**

B.A. in Computer Science *Expected 2029.5*

- **Relevant Coursework:** Computer Systems Organization, Operating Systems, Calculus II, Discrete Math, Linear Algebra, Statistics*, Machine Learning*

YK Pao School **Shanghai, China**

International Baccalaureate *2025.5*

- **Score:** 41 / 45
- **Honors:** Principal Award, Computer Science Attainment Award
- **Relevant Coursework:** Computer Science, Calculus, Algebra and Economics

** Future work*

WORK, PROJECTS & LEADERSHIP EXPERIENCE

Finovax Quantitative Finance Internship **2025.6 – 2025.8**

- Researched, developed, and backtested multiple quantitative strategies—including statistical arbitrage, risk parity, and MACD breakout—using Python-based frameworks; delivered vendor-agnostic data ingestion and interactive reporting
- Built market-neutral pairs trading on S&P 500 with rolling 2-year Engle–Granger cointegration, ±2σ entry/mean-reversion exits and quarterly rebalancing without look-ahead
- Implemented risk parity with rolling 126-day volatility and inverse-volatility weights. Stress-tested across market regimes and benchmarked against 60-40 and all-equity allocations, achieving materially lower drawdowns with a maximum drawdown as low as 0.74% versus 26 to 34%

Reinforcement Learning Research Project **2025.7 – Present**

- Conducted adversarial testing on AI detection tools by training an LLM to generate undetectable, human-like text using reinforcement learning, demonstrating critical susceptibilities in current content authenticity systems
- Trained LLM achieved an average detection rate of 1.2% (using 20% confidence as a threshold), demonstrating the susceptibility of current AI detection tools
- Created fully custom AI text detection model and reward function to improve writing style and quality, while minimizing divergence from original policy to maintain ability outside of writing
- Implemented distributed training across up to 8 Nvidia GPUs, scaling throughput by 7.5x while maintaining a stable training run

Sidekick App Project **2024.11 – Present**

- Built macOS local LLM app that keeps user data off the cloud, with an emphasis on security and privacy
- Integrates advanced features like RAG (Retrieval Augmented Generation), function calls, memory retention, and AI-powered tools to enhance productivity and context-aware interactions

- Obtained 3.2K+ stars on GitHub, ranked no. 1 for query "mac llm app" on Google

YK Pao School Robotics Team **Shanghai, China**
Team Captain *2022.9 – 2025.5*

- Used Java and OpenCV to create 3 custom robots tailored for the First Tech Challenge
- Used OpenCV and TensorFlow to create dynamic obstacle detection and avoidance systems for robots, improving their automated navigation capabilities
- Led 15-person team to 4th place in China in the 2023-2024 First Tech Challenge, and advance to the global championship in the 2024-2025 season

SKILLS, ACTIVITIES & INTERESTS

Technical Skills: Java (1 year), Python (3 years), C, VBA (1 year), SQL (1 year), Swift (3 years), x86_64 Assembly*
Languages: Fluent in English, Mandarin Chinese and Cantonese Chinese
Other Skills: Git, GitHub, Cursor, Jupyter Notebook, LaTeX, Excel, PyTorch, vLLM, HuggingFace TRL, TensorFlow, OpenCV
** Future work*