NICOLAS FELIX

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EDUCATION

COLUMBIA UNIVERSITY New York, NY
Dual Bachelor of Arts in Computer Science and Mathematics-Statistics *Spring 2026*

- NCAA Division 1 Track & Field Athlete
- GPA: 3.7

EXPERIENCE

CLAIMTEK Irvine, CA
Software Engineering Intern *May 2024 – August 2024*

- Designed web portal for licensees to manage account information, submit support tickets, and complete various workflows
- Replaced manual client onboarding by automating legacy phone-base workflows, reducing manual onboarding interactions by 40% and decreasing staff support workload
- Deployed containerized Flask backend on AWS EC2 and provisioned a PostgreSQL instance via Amazon RDS to support HIPAA-compliant medical billing workflows

AUTOMATED ARBITRAGE BETTING BOT (PROJECT) New York, New York
Volunteer Developer - Python, WebSockets, APIs (Community Project *October 2024 – Present*

- Automated identification of arbitrage opportunities from hundreds of markets across betting sites using APIs and WebSockets
- Wrote filtering algorithm to identify high-confidence correlated betting events, leveraging cosine similarity and large language models (LLMs) to increase efficiency and reduce false positives by over 60%
- Containerized pipeline with Docker. Facilitated a MongoDB schema to store arbitrage events and correlated market data

MULTI-CHAIN ARBITRAGE FRAMEWORK (RESEARCH) New York, New York
Research Project *September 2023 – Present*

- Developed a multithreaded arbitrage system to detect and execute profitable token cycles across L1/L2 chains using a modified Bellman-Ford (MBF) algorithm
- Engineered blockchain state listening, graph construction, gas-aware cycle detection, and Flashbots-compatible execution
- Extended system to handle cross-chain execution via Sequence-Independent Arbitrage (SIA) and collateralized lending schemes to facilitate non-atomic currency pair transactions

OTHER PROJECTS

Sudoku/2048 Solver *September 2024*

- Solved 100% of valid Sudoku puzzles automatically with backtracking, MRV heuristic, forward checking, constraint propagation
- Reached 2048 tile in 75% of iterations and 1024 tile in 98% of iterations by using minimax/ weighted evaluation function. Corner gradient and monotonicity heuristics increased algorithm success. Maximum tile reached is 4096

Hand Gesture Classifier Machine Learning *November 2024*

- Implemented a CNN architecture with one-hot encoding, classifying hand gestures with over 99% accuracy (Keras API)
- Incorporated dropout layers to address overfitting, enhancing performance by ~10% on validation data
- Applied softmax activation for probabilistic output interpretation and one-hot encoding to format categorical labels for training

BlackJack Probability Analysis *December 2024 – January 2025*

- Programmed Blackjack game/library from scratch, with dealing/shuffling mechanisms to mirror real-world probabilities. C++
- Simulated 1000's of games to assess effectiveness and Expected Value of different game strategies under different assumptions

ADDITIONAL

Programming: Python, Java, C/C++, JavaScript, HTML, CSS, Swift, Solidity, R, Git, JSON, TCP/IP, sk-learn, Matplotlib, Typescript
Frameworks/tech: React, Node.js, Tailwind CSS, Bootstrap, MongoDB, Django, Flask, Docker, Kubernetes, AWS, PostgreSQL
Tools/Concepts: APIs, WebSockets, NLP, Applied Machine Learning, Statistical Modeling (NumPy/Pandas), Slippage, Optimization, Gradient descent, Linear regression, Statistical analysis, Probability Theory, FLP Theorem, Blockchain, Consensus Protocols, REST API
Interests: Running, Surfing, Salsa, Bachata, Tennis, Pickle-ball, Sailing