WU TONG

Email: ted@wu.engineer **LinkedIn: ted-tongwu** **GitHub: TongWu**

PROFESSIONAL SUMMARY

Dedicated professional with a profound interest in programming and machine learning. Excelled in using different programming languages to tackle complex problems and algorithms, applying diverse machine learning algorithms and big-data optimization techniques to novel applications. Have a deep understanding and application of components and optimization in languages such as Python, C++, and MySQL. Also, proficient in embedded programming and sensor algorithm development. Gained in-depth understanding and application of deep learning algorithms and big-data system optimizations through multiple projects and an internship. Demonstrated exceptional team collaboration and a keen ability to address issues. Key strengths: enthusiasm, quick learning, patience, and being a pivotal team player.

CORE COMPETENCE

- Cloud Platform (Azure Synapse, Data Factory)
- Agile Development (DevOps, MLOps)
- Python, C, C++, Java, R, MySQL, MATLAB
- Machine Learning (TensorFlow, PyTorch, Keras)
- Database (ER, SQL, Neo4j, MongoDB)
- Embedded Systems (Linux, MIPS, Arduino, Mbed)
- Big Data Systems (ETL, Hadoop, Spark, Flink)
- Electronics (LABVIEW, SolidWorks, Altium Design)
- Financial Models (CAPM, Black-Litterman)
- Blockchain (Solidity, Truffle, NFT)
- Natural Language Processing (Sentimental Analysis)
- Problem Solving and Group Cooperation

EDUCATION

National University of Singapore Singapore
Master of Computing in Computer Science (General Track) Aug 2023 – Dec 2024 (Expected)

- Core courses: Python, Data Structure and Algorithm, Big Data Systems & Stream Processing, Computer Systems Architecture, Artificial Intelligence, Software Engineering, Full-Stack Development, Data Analytics.

Columbia University New York, US
Master of Science in Electronic Engineering, GPA: 3.5 / 4.0 Sep 2022 – Oct 2023

- Core courses: Databases, Computer Networks, Blockchain, Analysis of Algorithm, Reinforcement Learning, Deep Learning, Large Scale Data Streaming Processing, Advanced C++, Machine Learning Applications in Finance.

University of Manchester Manchester, UK
Bachelor of Engineering in Electronic Engineering, GPA: 3.93 / 4.0 (Top 10%) Sep 2019 - Jun 2022

- Core courses: Algorithms, Computer Networking, Computer Architecture, Concurrent System, Embedded System, Optical Devices, Circuit Design, C Programming, Digital Signal Processing, VLSI.
- Thesis: Electric Bike Security System Enhancement – Security System (Graded as top 5% student)

WORK EXPERIENCE

Ernst & Young LLP Singapore Singapore
Data Engineer Intern, Data & AI – Technology Consulting May 2024 - Present

- Built pipelines for data ingestion, transformation and quality check as a part of the universal ETL system on Azure.
- Researched and developed performance testing for the pipeline, tuning the parameter and Spark pool resources, boost 3X the parallelism performance for file processing. Optimised the querying speed for SQL for 150%.
- Proactively liaised with clients, clearly understood and fulfilled the table transformation requirements.
- Comprehended Agile development processes, swiftly learned and mastered data mining knowledge. Actively shared progress and understanding during regular meetings.

Holley Group Co., Ltd Hangzhou, China
Software Engineer Intern Jul 2021 - Sep 2021

- Built an internal employee Q&A system using PHP and Spring framework.
- Researched and developed an innovative method integrating clustering (K-means) algorithm and LSTM model to boost performance of anomaly traffic detection. Deployed to test environment and brought 90% of accuracy.
- Presented and brainstormed in weekly routine meetings, to sum up development progress and thoughts of team.

PROJECTS AND RESEARCH

Columbia University: MyMake, A Comprehensive Make Utility Replica Jun 2023 – Jul 2023

- Developed a sophisticated make command utility mimicking a significant portion of ‘make’ functionality.
- Implemented core features including the interpretation of phony targets, dependency management, and variable handling. Utilized advanced C++ concepts, including the STL Library, file system handling, and regular expressions.
- Constructed a mini-database system, ‘xdb’, to efficiency manage and store build rules and dependencies, leverage custom serialisation methods.

- Discovered cache functionality to optimize build times by checking up-to-datedness of files against makefile changes.
- Executed parsing and execution of 'MyMakefile' with support for variables, command lines, and rule definitions.
- Incorporated error handling and exceptions for robustness against invalid input and runtime errors.
- Designed to manage dependencies and automate build process efficiently for various project types.
- Graded as top 20% student through high completeness of project, and diverse extension of utility.

Columbia University: Investment Project Jun 2023 - Jul 2023

- Created client personas and risk tolerance to construct tailored investment plans.
- Orchestrated a strategic initiative, selected and invested in a diversified portfolio of 15 U.S. stocks, achieving a 5% profit within half a month, the highest in class.
- Utilized Random Forest, SVM, and LSTM-GRU algorithms to boost financial models (Equity Valuation, CAPM, Index, Mean-Variance, Multi-factor, Black-Litterman, Algorithmic Trading) for effective position management.
- Applied Sharpe Ratio, ANOVA, and Fama French methods for detailed stock and position analysis.
- Presented strategies to peers and professors, receiving accolades for innovative approach and clarity of presentation.
- Graded as top 10% student through a comprehensive report and high standard financial ML model.

Columbia University: Cryptocurrencies Prediction with Sentimental Analysis Mar 2023 - May 2023

- Executed real-time sentimental analysis of Twitter data to predict cryptocurrency prices, achieving over 80% accuracy using Lexicon and LSTM-GRU models.
- Implemented a high-performance streaming framework on Apache Spark, applying optimizations includes operator reordering and load shedding to boost efficiency by 30%.
- Created a dynamic, user-friendly website for visualizing sentiment-driven predictions and trends for a 30-day period.
- Collaborated in a diverse team setting, contributing to critical discussions and decision-making processes, and improving project outcomes through collective expertise.
- Scored as top 20% student by a comprehensive report and presentation, showcasing group cooperation and exceptional ability in both theoretical understanding and practical implementation.

Columbia University: Full-Stack NFT Painting Trade Platform Mar 2023 - May 2023

- Pioneered a NFT trading platform for paintings, integrating Solidity-based backend with a React-based frontend.
- Innovated by using IPFS for decentralized storage of images and deploying smart contracts on Ethereum's test net.
- Expanded seamless MetaMask wallet integration for streamlined user transactions and NFT management.
- Fostered collaborative brainstorming sessions for continuous platform improvement.
- Scored as top 5% student through report, showcasing group cooperation and practical implementation.

Columbia University: Performance of ResNet Architecture Oct 2022 - Dec 2022

- Established ResNet-18 architecture, evaluating multiple optimizers including Adam, Adam-W, Nadam, AMSGrad, and newly introduced Padam.
- Analysed performance metrics such as training loss, validation accuracy, and training time, demonstrating comprehensive understanding and application of deep learning principles.
- Spearheaded integration of Padam, exhibiting its enhanced robustness and accuracy compared to other methods.
- Achieved top 10% ranking in class through detailed analysis and final oral presentation, showcasing exceptional ability in both theoretical understanding and practical implementation.

University of Manchester: Electric Bike Security System Enhancement Sept 2021 - May 2022

- Developed an advanced anti-theft security system for bicycles, incorporating sensors and communication modules.
- Programmed Arduino boards for sensor data acquisition and Bluetooth Low Energy (BLE) communication, facilitating efficient data transfer and system integration.
- Designed and implemented a multi-sensor framework, integrating Hall sensors, Time of Flight (ToF) sensors, IMU, and GNSS/GSM modules, achieving enhanced theft detection and real-time location tracking.
- Constructed a unique fingerprint-based security mechanism, augmenting traditional bike security methods.
- Designed a new IMU fusion algorithm, boosted 3x of performance by adding Random Forest and LSTM model.
- Conducted extensive testing under varied conditions, demonstrating system's efficacy in theft prevention and user notification via SMS alerts. System's precision in testing reached 98%.
- Demonstrated in oral, with marketing, software and hardware integration and test results. Scored as top 5% student.

HOBBIES

- Self-hosting websites/services administration, Blogger
- 6 years of Guitar player with proficient level
- Raspberry Pi, Arduino geek