Bao Tran

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TECHNICAL SKILLS

- **Languages**: Python (Pandas, NumPy, Scikit-learn), R, JavaScript, TypeScript, C, C++
- **Technologies/Frameworks**: React, Next.js, Node.js, HTML, CSS, Python Flask
- **Database/Cloud**: SQL (MySQL, PostgreSQL, NoSQL), MongoDB, Upstash, AWS, Azure, Vercel
- **Tools**: Jupyter Notebook, Visual Studio Code, Git, GitHub, Bash, SSH, REST API
- **Platform**: Windows, Linux, VMware Workstation
- **Machine Learning**: Supervised/Unsupervised Learning, Natural Language Processing, Large Language Models

PROJECTS

Password Encrypter | Next.js, React, TypeScript, Python Flask, Gunicorn, Nginx, SQL, AWS, Vercel
- Implemented a full-stack web application using Next.js framework with Python Flask, Gunicorn, Nginx, and an SQL database, deployed on AWS EC2 and Vercel cloud platforms.
- Integrated **100,000** unique encryption keys stored in a SQL database to enhance a custom encryption algorithm for encrypting passwords, achieving **99%** security against cracking attempts.
- Employed testing mechanisms to identify and resolve bugs, ensuring an error-free deployment to production.

Personal Portfolio | Next.js, React, TypeScript, Tailwind CSS, MongoDB, Prisma, Vercel
- Developed a responsive personal portfolio using Next.js, TypeScript, and Tailwind CSS, hosted on Vercel cloud platform.
- Implemented a contact form with backend functionality using Node.js, allowing users to connect via email and stored messages in a MongoDB database.

Insurance Claim Prediction | Python, Pandas, Scikit-learn, Random Forest, SHAP, GridSearchCV
- Collaborated with three team members to develop a Random Forest model using Scikit-learn, working with a dataset of over **7,000** samples and **29** features from ASNA 2025 Hackathon.
- Performed comprehensive data preprocessing and feature engineering to enhance model accuracy by **3%**.
- Utilized SHAP (SHapley Additive exPlanations) to analyze feature importance, identifying seven dominant features with the highest impact on model performance.
- Leveraged GridSearchCV hyperparameter tuning and cross-validation to optimize performance, achieving **93.34%** accuracy rate.

Tetris Game | C++, Valgrind, Make, Object-Oriented Programming, Software Development Lifecycle
- Collaborated in a team of three to design and develop a Tetris game, following the Software Development Lifecycle (SDLC), including planning, UML modelling, implementation, testing, and deployment.
- Applied Object-Oriented Principles to develop scalable software, utilizing design patterns such as Observer, Decorator, and Factory for modular and maintainable code.
- Conducted manual playtesting to ensure game mechanics, such as block movement, collision detection, and scoring, worked as expected, and resolved identified issues for improved performance and user experience.

EXPERIENCE

Crew Member — Charlottetown, PE
Wendy's Company — Jan. 2022 – May. 2022
- Provided exceptional customer service by efficiently taking orders, processing transactions, and ensuring a positive dining experience for guests.
- Coordinated cleaning and organizational efforts with a team of **12** crew members, elevating store presentation standards and resulting in higher customer satisfaction ratings and improved dining experiences.

Library Volunteer — Charlottetown, PE
Colonel Gray High School — Sep. 2020 – Jan. 2021
- Assisted the librarian in organizing, shelving, and managing the library's book inventory.
- Collaborated with other volunteers to maintain a clean and organized environment, ensuring books were always returned to their designated shelves.

EDUCATION

University of Waterloo — Waterloo, ON
Bachelor of Mathematics — Sep. 2023 – Aug. 2028
Coursework: Probability & Statistics, Advanced Linear Algebra & Calculus, Object-Oriented Programming (GPA 3.7)