Benson Yu

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Relevant Skills

Programming/Scripting: Python, MATLAB (Onramp), JavaScript
Hardware: Arduino UNO, ESP32 , Soldering
Tools/Platforms: Altium Design, SolidWorks, GitHub, Visual Studio Code, Arduino IDE,
Soft Skills: Teamwork, Time Management, Communication, Leadership, Project Management

Certifications

MATLAB Onramp, MathWorks Issued April 2025

- Applied MATLAB for data analysis, data visualization, and programming fundamentals

Projects

Triboelectric Nanogenerator | Circuits, Mechanical Design, Prototyping, CAD Dec 2025

- Designed a wind-powered triboelectric nanogenerator using materials selected from the triboelectric series, resulting in a voltage output of over 5 volts measured with an oscilloscope
- Modeled a custom frame in SolidWorks and assembled mechanical and electrical components together
- Optimized device geometry and material contact to improve voltage stability and output

Distribution Fitting & Visualization Tool | Python, Matplotlib, SciPy, Pandas Dec 2025

- Developed a Python application that collects numeric datasets via user input or CSV import, converting them into structured analysis-ready formats
- Implemented automated label handling, conditional header parsing, and numeric type validation using Pandas
- Generated histograms and fitted probability distributions using SciPy
- Built modular data-processing pipelines to support UI integration in Streamlit

BotAutonomy | Arduino UNO, ESP32 Camera Microcontroller, JavaScript React May 2025

- Designed and built an autonomous plant care system by integrating an Arduino UNO, ESP32-CAM, stepper motors, and moisture sensors, resulting in automated watering and plant monitoring
- Implemented a teachable machine model by training it on plant health images, providing real-time evaluation of plant conditions and dynamic visual feedback on a digital display
- Developed a web dashboard by using JavaScript React and connecting it to the ESP32-CAM system, allowing users to view live feeds and health status for improved monitoring
- Applied hardware and software integration through project design, prototyping and testing, resulting in enhanced technical problem-solving, programming, circuit design, and project management skills.

Experience

Private Math Tutor, Self Employed – Waterloo, ON Dec 2025 - Present

- Provided 1-on-1 math tutoring to a Grade 7 student on the autism spectrum, with structured guidance
- Diagnosed and addressed gaps in foundational math concepts that hindered progress in higher-level topics
- Adapted lessons dynamically based on ongoing assessment of student understanding and learning needs
- Fostered a supportive learning environment that prioritized confidence and incremental skill development

Seeds Collection Assistant, Seeds of Diversity – Waterloo, ON Jul 2025 - Sept 2025

- Collaborated with peers to conduct germination tests to train an algorithm that predicts germination success rates
- Maintained high attention to detail while packaging fragile and irreplaceable seeds for long-term storage and upcoming distribution events
- Entered and organized newly collected seeds into the seed library database, ensuring accurate and accessible

records

Sponsorship Lead, Bluevale Electric Vehicle Team – Waterloo, ON   Sept 2024 – Jun 2025
- Secured $1000+ in monetary funding by building and maintaining relationships with local businesses, strengthening the team's financial resources and community presence
- Mentored 2 new team members by providing training on outreach strategies, improving overall efficiency

Math Tutor, United for Literacy – Waterloo, ON   Oct 2024 – Dec 2024
- Tutored 3 young learners weekly, teaching foundational math concepts and adapting lessons to individual learning styles, resulting in all 3 learners completing the United for Literacy Number Ninjas program
- Fostered an encouraging and interactive learning environment by incorporating math-related games, block programming, and group activities, resulting in improved participation and engagement
- Developed problem-solving and communication skills by tailoring lessons to diverse learning styles and effectively breaking down math concepts for learners

Food Market Leader, Seeds of Diversity – Waterloo, ON   May 2024 – Sept 2024
- Co-managed 6 weekly food markets over the summer by coordinating market set up, product selection, cash handling, and customer service, resulting in 30+ customers per event, including numerous returning customers
- Coordinated with 3 local farms/gardens to ensure fresh produce supply by maintaining regular communication and handling order process, resulting in strong relationships with suppliers
- Led customer-facing interactions in a team environment by assisting customers with purchases and collaborating with peers, strengthening teamwork, organization, and customer service skills

Education

University of Waterloo   Sept 2025 – April 2030

Bachelor of Applied Science - BASc, Nanotechnology Engineering, Honours, Co-operative Program

Honours, Awards and Distinctions

1st Place Displacement Dragster Olympics, The University of Western Ontario   May 2025
- Engineered a balloon-powered car that traveled the farthest distance in the displacement dragster event at Western University Science Olympics

1st Place 24 Volt Electric Vehicle Challenge, The University of Waterloo   May 2025
- Won first place at the Electric Vehicle Challenge by engineering an electric car that completed the most laps.