Tianyu Guo (Ti)

3B Mechatronics Engineering

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Software   JavaScript, C/C++, Python, Ruby, HTML5, Matlab, CSS3, SQL, PostgreSQL, QML
Libraries/Tools   React, Redux, Node.js, Flask, Rails, Express, jQuery, API, Git, API, D3, Qt, Sensor Fusion, OpenCV
Other   AutoCAD, SolidWorks, EagleCAD, PhotoShop, Illustrator, Fluid Mandarin

EXPERIENCE

IBM | IoT & AI Engineering Intern | Toronto   Jan.2019 – Present
Python, JavaScript, Flask, PostgreSQL, Node.js, React, Redux, IBM Watson, MQTT
- Developing a defibrillator monitoring system with a multiprocessing embedded Flask backend to handle data transmission
- Prototyping an end-to-end scalable IoT locker system for shipment distribution. Developing connection between multiple client servers using Apache Kafka and MQTT, together with API endpoints and user interface for triggering communication
- Programming a 4DoF robotic arm, capable of picking up self-trained targets via Faster R-CNN, and utilizing inverse kinematic on NVIDIA Jetson TX2 platform
- Organizing an 8-week office-wide lunch workshop on "Life Design" and other events as IBM Canada's Future Blue Interns Lead

North Inc. (Thalmic Labs) | Software Engineering Intern | Waterloo   Sep.2017 – Dec.2017
JavaScript, Node.js, C++, Python, QML, Qt, Unix, AWS, Unit Testing, Framer.js
- Developed software infrastructure to automatically convert UI layout and workflow into interactive front-end modules in Framer.js while porting the existing codebase, increased efficiency by 8X for UI deployment
- Developed a GUI that maps user control input while adjusting the display angle in 3D based on user movement using QML
- Programmed an embedded algorithm to decode and display Easing motion curves under restrictive data transmission rate
- Organized 2 usability testing sessions, worked closely with 6 active users, and refined UX workflow based on user data

Medella Health | Systems Developer Intern | Waterloo   Jan.2017 – Apr.2017
Python, C, C++, Illustrator, CorelDRAW, pySerial
- Developed Python based centralized control software allowing cross-platform data synchronization
- Automated 45% of operation processes through the development of a chatbot-like control interface for sensor assembly robots
- Optimized global hardware sourcing process, saving $6000 over 4 months, reducing hardware sourcing time by 50%
- Developed ARM-based 4-axis robot using G-code and C++, provided a 900% reduction in glucose sensor fabrication speed

Busboy Inc. | Software Engineer / Co-founder | @Founder Institute Incubator | Waterloo   Jul.2016 – Aug.2017
React, JavaScript, HTML, CSS, InVision, Illustrator
- Pitched to 30+ investors, received investment, and was recognized by YCombinator
- Launched a SAAS based mobile coupon tracking system with 2 client locations, amassed a 2200+ audience
- Developed React components for frontend and UI & UX specs for web-based coupons and client website
- A/B tested to iteratively create Facebook ads based on user data, resulted in a 600% increase in ads conversion rate

Khazanah Americas | Innovation Engineering Intern | San Francisco   May.2016 – Aug.2016
JavaScript, HTML, CSS, C++, OpenCV, Arduino, Raspberry Pi, Excel Macros
- Created a web app that parses users' search query into Google Search Scripts and applies to commonly used sites
- Interviewed 70 Bay Area tech startups and analyzed their technical competencies to inform investment decisions
- Programmed an embedded laser-graffiti system implementing OpenCV auto color search & homographic transformation
- Developed interrupt based embedded software architecture for the Kinect-based 3D human body scanner
- Developed a deep understanding about tech trends through market research and representing company in tech conferences

Global Product Exchange | Co-founder | Waterloo   Sep.2017 – Feb.2018
- Led a multi-functional team of 5 to redesign a successful Chinese product for a North American market
- Conducted patent search, organized usability testing in architecture schools, and planned crowdfunding campaign
- Formulated business strategies and create business reports for clients

PROJECTS

Productivity Rank - Content Sharing Site React, Redux, PostgreSQL, JavaScript, HTML, CSS, Ruby on Rails, APIs, cookies   **live | github**
- Interfaced with PostgreSQL database using Active Record, and wrote controllers to handle HTTP requests from frontend
- Used React Router DOM library to allow components to track their current routes and apply corresponding CSS properties
- Set cookie in localstorage to record user behavior and recognize returning users without the need of signing in
- Used Redux global state to store user search queries and asynchronously access them to render searched posts in real time
- Implemented User Authentication flow using Ruby on Rails' MVC model and interfaced with Redux cycle

Voicer - Tweets Search Engine Node.js, Express, JavaScript, HTML, CSS, D3 library, jQuary, Twitter API   **github**
- Allowed users to search tweets from Twitter's API endpoint by passing in a query string which was fed into an Express backend
- Parsed tweets and used Javascript sentiment analysis library to determine the emotional contents of tweets
- Used D3 SVGs to display parsed tweets data giving users a sleek uniform interface
- Developed custom Controller to handle AJAX request from frontend

Job Evaluator - Chrome Extension JavaScript, HTML, CSS, DOM Manipulation   **github**
- Created dynamic elements that float on any webpages by manipulating DOM elements using CSS
- Performed efficient real-time search on DOM content and stored user search preference as states Chrome's local storage
- Created an inject script using Vanilla JS to insert custom content into users' browser allowing them to view the score of the job

Natruwake Smart Pillow - Sleep Tracking System C, C++, Arduino, Android Studio, Google Cloud, Machine Learning   **github**
- Analyzed sleep cycles by modeling using a moving average smoothing algorithm and linear regression
- Developed timer interrupt-based embedded software architecture for multi-tasking usage

The Waterloo Game - Embedded Game C, Arm Cortex-M4 processor
- Utilized mutual exclusion control policy for path calculation and collision detection, while implementing integration testing and unit testing to ensure thread safety

Bluetooth earpiece wireless charging shell AutoCAD, SolidWorks, EagleCAD
- Developed the portable wireless charging shell for Bluetooth earpieces
- Conducted market research & customer discovery process for the Startup project

Viking Robotics - Autonomous Racing Robot C, C++, sensor fusion, OpenCV, Raspberry Pi, Arduino
- Developed robot's Mapping Algorithm using multiple ultrasonic sensors, motor encoders, and infrared sensors
- Led the team won the 2nd place in the International Autonomous Robot Racing Competition, as the team's Hardware Lead
- Developed IMU based P-controlled algorithm to enable accurate turning and driving straight

Cats Collection - Cats Displaying Site Ruby on Rails, HTML, MVC, SQL
- Developed models with validations to keep database organized. Used Rails' security token to prevent CSRF attacks
- Developed Joins Table in the database, and retrieve data from database using SQL for displaying user data

Rails Lite - Simple Rails' Clone Rack, Rails, Linux Kernel
- Used "binding" Kernel method to build the ERB template rendering library functionalities
- Developed Rail's ActionController using Rack's Response command and avoid double render error

Favours – UX Designer **–** A phone app that seeks to promote the use of public transit
- Created Design Spring guidelines; conducted in-person interviews with users; designed multiple versions of user workflow
- Second Place in 2017 UXperience Product Design Competition

EDUCATION

Candidate for B.A.Sc., Honours Mechatronics Engineering, 3B - University of Waterloo   Sep.2015 – Apr.2020
- Founded UW Arduino Workshop, taught 300+ students; Co-President of Effective Altruism Waterloo; President of Natruwake Student Design Team

Founder Cohort of 2017 - Founder Institute Incubator Waterloo Campus   Jan.2017 – May.2017
- Trained skills in customer & market discovery, product development, branding, prototyping, project management

Full Stack Software Student - App Academy   May.2018 – Aug.2018
- Systematically learned and practiced Ruby, JavaScript, React.js, Redux, Rails, SQL, Postgres, HTML, CSS, and algorithms

EMPLOYER COMMENTS

"Ti is the best student I have worked with out of the past 17 coop students that were hired on our team."

"Ti is a pleasure to work with, open to guidance and has a very clear direction and purpose. Ti is methodical in regards to documenting and reporting results. He considers all possible alternatives and is diligent in keeping the company directives in mind when planning and carrying out his objectives. His team dynamics are also excellent, as are his communication skills. He is truly committed to assisting us in improving health outcomes by creating a focused and profitable enterprise."

"I was especially impressed with how he re-prioritize his day on a regular basis. Ti tasked himself with literature search, prototype development, verification, and experimental design. In addition, he showed his passion for continuous improvement by arranging workshops to discuss methods to improve productivity using software tools. "

"Ti will always want to tackle the most important problem first and the extra care he shows makes him a great addition to the team! If there is any doubt, I encourage you to contact me."

-- Maarij Baig, Chief Scientific Officer @ Medella Health (Coop Evaluation: Outstanding)

"The student (Ti) has significantly exceeded all behavioral and developmental performance expectations in respect to output, quality standards, delivery of goals and assignments. Ti has distinguished himself with his unique contribution and exceptional performance. "

-- Shahril Ibrahim, Director and Head @ Khazanah Americas (Coop Evaluation: Outstanding)

"Ti is an enthusiastic and selfless contributor to the team. Throughout the term, he was committed to and made good process suggestions to improve the effectiveness of our team. One area in which Ti excelled was in engaging others throughout the software organization to embrace the prototyping ethos. He organized and facilitated workshops on both personal productivity and iterative software development that was very well received."

-- Lee Payne, Software Team Lead @ Thalmic Labs (Coop Evaluation: Excellent)