Jack (Jianxiang) Xu

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3A Mechatronics Engineering - AI option | University of Waterloo | B.A.S c (2016 - 2021)

SKILLS

Software	C++, C, C#, Java, Python, Javascript
Tools	ROS, Linux, Git, FreeRTOS, OpenCV, OpenGL, HoloLens, Unity, IAR, VisualStudio, MATLAB
Hardware	LabVIEW, NXP ARM M3/4, AVR, PLC, Arduino, ESP8266, Soldering, Rapid Prototyping
Mechanical	Fusion 360, AutoCAD, SolidWorks, VectorWorks, Laser Cutting, 3D printing, Machining

EXPERIENCE

Team Lead | **Hummingbot - International Autonomous Robot Racing Team (IARRC)** *(Jan. 2018 - present)*

- Leading and managing a team of 20 students, developing a fully autonomous mobile robot that is capable of maneuvering through obstacles, lanes, and traffic signs in high speed on rough terrains (Jetson TX2, ZED, M4)
- Conducting mechanical, electrical and software system designs for the robot (SolidWorks, ROS, C++/C)

Jack of all robots | **Trexo Robotics** *(Sept. 2018 - Dec. 2018)*

- Built medical paediatric exoskeletons for children with walking difficulties & brought back a smile to many families
- Developed a robust full stack software system that covers from firmware (C, FreeRTOS, Cortex M4 & AVR), ROS & ROS_Control, Linux Environment, debugging tools (Python), and Android applications (C, C++, Java, ROS Java) to provide a seamless and comfort rehabilitation experience
- Researched and developed a new control system to allow patients to initiate steps whenever they want
- Optimized android app more than 50% in both threads, CPU and Memory usages

AR Software Engineering Intern | **Interaptix AR** *(Jan. 2018 - April. 2018)*

- Created a state-of-the-art real-time AR project and conducted varies R&D on the product
- Developed a variety of evaluation tools (C++, OpenGL, Python) for multi-camera synchronization and networking
- Implemented a custom calibration and point-cloud rendering for multiple RGB-D cameras

Embedded Firmware Developer | **Baanto, Nytric Inc.** *(May. 2017 - Aug. 2017)*

- Improved performance of the firmware and developed a unique and adaptive algorithm (C++) to recognize polygon shapes for multi-touch ShadowSense touchscreens in realtime over 60Hz in all form factor
- Devised useful analysis tools (Excel, VBA, python) and a real-time sensor data visualizing application (C#, C++, Unity), which significantly minimized amount of time and efforts spent on debugging and testing by over 50% (Tools were also being used for conference demos to showcase complex operations behind the scene)

Product Manager | **TobyX (Startup)** *(May. 2017 - Nov. 2017)*

- Devised a dynamically scalable IoT system to provide a revolutionary experience for hotel services
- Designed and prototyped embedded hardware systems such as smart wireless outlets, thermostats, and hub devices with a secured local network system (ESP8266, ARM boards, C++/C)

PROJECTS

Ctrl-F-IRL *(Mar. 2018)*	Made a real-time offline AR searching tool on the Android platform, which brings 'Ctrl-F' experience in real life to highlight all key words in a glance with the cellphone camera (Java, ABBYY)
TrackyfAI *(Sept. 2017)*	Built a surveillance processing tool (for Canadian Special Operations Force Command) that allows military analysts to better analyze large quantities of video footage (YOLO, Python, OpenCV)
Project Helm *(Feb. 2017)*	Designed and developed a smart IoT helmet for bikers that provides haptic feedback and visual cues for both bikers and any approaching vehicles (C, C++, Xadow Kit, IMU)
Synthesizer *(Jan. 2017)*	Created a music synthesizer from scratch within 12 hours, using provided Arduino, Gyro, and other hardware components. (2nd place in IEEE Hackathon) (C, C++, Rapid Prototyping)
Robotic Arm *(Nov. 2016)*	Designed and built a versatile robotic arm with 4 DoF to perform supervised tasks (C++, C) Implemented a PID and sigmoid trajectory controller, and inverse kinematics for a smooth operation

ACTIVITIES

CogDrive	Undergrad research assistant for autonomous vehicles with a focus on mobile robots
IARRC Org.	Initiated a new organization team for the 2019 International Autonomous Robot Racing Competition
WATonomous	Implement a more accurate and efficient lane perception algorithms (C++, OpenCV)
UW MarsRover	Worked on mechanical and computer vision systems for an autonomous Mars Rover robot
Photography	A short break to retrieve myself back from my work to discover the beauty of every moment