





Jack (Jianxiang) Xu

3A Mechatronics Engineering - AI Option | University of Waterloo | B.A.Sc (2016 - 2021)

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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

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), middleware (ROS & ROS_Control, Linux Environment), debugging tools (Python), and Android applications (C, C++, Java, ROS Java), providing a seamless and comfortable rehabilitation experience
- Researched and developed a new control system allowing patients to initiate steps as they please
- Optimized Android application by over 50% in CPU, memory, and thread usages

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)

AR Software Engineering Intern | Interaptix Augmented Reality

(Jan. 2018 - April. 2018)

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

Embedded Firmware Developer | Baanto, Nytrix 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 minimized time and efforts spent on debugging and testing by over 60% (The visualizer has also being used for conference demos to showcase complex operations behind the scenes)

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)

TrackyAI

(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 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 PD controller, a sigmoid trajectory, 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

- Implemented a more accurate and efficient lane perception algorithm (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