Jack (Jianxiang) Xu

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

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SKILLS & TOOLS

Software	C++, C, C#, Java, Python, Javascript
Tools	OpenCV, OpenGL, TensorFlow, HoloLens, Unity, Linux, Git, IAR, VisualStudio, MATLAB
Hardware	LabVIEW, EAGLE , PLC, Arduino, ESP8266, ARM boards, Soldering, Rapid Prototyping
Mechanical	SolidWorks, VectorWorks, Fusion 360, AutoCAD, Laser Cutting, 3D printing, Machining

EXPERIENCE

Team Leader | **Robot Racing Team (Sub-team of UW Robotics Team)** *(Jan. 2018 - present)*

- Led a team of 15 students, developing a fully autonomous racing robot for IARRC-2018
- Designed and developed the mechanical, electrical and software systems for the robot

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

- Worked on a state-of-the-art real-time AR project (HoloLens, UWP, OpenGL, OpenCV, C++)
- Designed and proposed unique and innovative ideas to boost hardware performance and user experience
- Developed a variety of testing and evaluation tools (C++, OpenGL, Python) for cameras, network, and hardware
- Implemented custom calibration and point-cloud rendering for multiple RGB-D cameras (C++, OpenCV, Python)
- Conducted Machine Learning R&D, including potential strategies to integrate results into existing software

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

- Improved the performance of the firmware and developed a creative algorithm (C++) to compute vertices and recognize the polygon shapes for multi-touch multi-scale ShadowSense touchscreens
- Developed new analysis tools (Excel, VBA, python) and a real-time sensor data visualizing system (C#, C++, Unity), which reduced the time spent on debugging and algorithm testing by over 50%

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

- Developed dynamically scalable IoT systems (including Cloud, Hubs, and Things) to provide a revolutionary experience for hotel services and advertising
- 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 Android Platform, which brings 'Ctrl-F' experience in real life to find keywords in a glance with the 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, using Arduino, Gyro, and other electronic components from scratch within 12 hours, which won 2nd place in IEEE Hackathon

Extensa Robotic Arm *(Nov. 2016)*
- Designed and built a versatile robotic arm with 4 DoF to perform supervised tasks
- Implemented PID control, inverse kinematics, and auto calibration for smooth and precise motions
- Integrated voice and Bluetooth onto the arm for a intelligent user interface (C++, C)

Robot Design *(Feb. 2016)*
- Built a variety of prototypes such as a microwave, and a multi-floor elevator (myDAQ, LabVIEW)
- Won 1st place in Halton Skills Competition for robotic and control system design

TEAMS & ACTIVITIES

UW Robotics Team
- Worked on the mechanical and electrical design for an autonomous Mars Rover robot
- Currently working on the computer vision and developed tennis tracking algorithms.

Waterloop Team
- Developed firmware an IMU for a supersonic train for SpaceX's Hyperloop Competition.

FRC 3161 Team
- Designed mechanical systems for First Robotic Competition. (Currently working as a Mentor)

Photography
- A short break to retrieve myself back from my work to discover the beauty of every moment