

**Isaac Qureshi**

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View Work At: [www.laq3.github.io/personal\\_site](http://www.laq3.github.io/personal_site)

Graduation: May, 2016

Major: Computer Science

Major GPA: 3.13

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**OBJECTIVE**

Cornell University Computer Science major seeks to leverage experience in independent app development and robotics to create innovative solutions at a fast-paced technology company.

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**EDUCATION**

**Cornell University, College Of Engineering, Ithaca, NY** 2011-Present

- Computer Science: Honors Object Oriented Programming, Computer Vision, Robot Manipulation, Artificial Intelligence, Introduction to the Analysis of Algorithms
- Mathematics: Single and Multivariable Calculus, Linear Algebra
- Science and Health: Nutrition, Health, and Society, Human Environment Relations, Psychology, Electromagnetism, Waves and Thermal Physics, Tropical Cropping Systems

**Computer Skills**

- Languages: C#, Objective-C, C,C++, Java, OCAML, Assembly, Python
- Software: Matlab, XCode, MS Office, Unity, OpenCV, GIMP, ROS, D3
- Platforms: Microsoft Windows, iOS, OS X, Linux, Android

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**EXPERIENCE**

**IQ Labs, Limited Liability Corporation** 2012-2014

Founded IQ Labs, LLC with the strategy of creating and releasing novel virtual reality gaming experiences for Android and iOS platforms to generate advertisement-based revenue. Applications developed included:

- Daydream Z (First Person Zombie Shooter): Invented novel user interface using integrated data from accelerometers, gyroscopes, and the camera to control the orientation and position of virtual reality objects. Designed glove and stationary visual tracking devices to allow the camera system to track user motion during gameplay. Developed multiple applications for the glove to control the grasping of virtual objects, drawing in 3D space, controlling the environment views, and operating the virtual weapons. Created multiple game modes to allow gameplay with or without visual tracking devices.
- Kid Pilot (3-D Flight Simulator): Created gyroscopic interface to provide users with precise control of a virtual aircraft with subtle tilts and turns of the wrist, including acrobatic maneuvers such as barrel rolls. Designed game concept based on flying the aircraft through computer-generated targets of increasing difficulty and intensity. Developed the

GUI to allow users to customize their controls and gameplay. Provided multiple tutorial modes including video examples and a step-by-step manual. Created an algorithm to generate music that adapts to game progress.

### **Independent Projects**

- Robot Smart Phone Interface (Telecontrol Interface): Collaborated with fellow student to construct a robot with a smartphone telecontrol system. Ported gyroscope controls developed for Daydream Z and Kid Pilot to create first-person remote interface over a LAN. Developed an application to allow the user to create octomaps by moving the robot through its environment. Created particle system to view 3D real time RGBD camera feed overlaid on octomaps from Microsoft Kinect. Provided feature to allow users to explore this 3D map of their environment on the phone using wrist movement and touch screen commands. Ported wearable visual tracking system from Daydream Z to allow the user to take first-person control of the robot arm to grasp and manipulate objects
- Autonomous Robot Extension: Created autonomous behavior for robot that user can turn on and off from the interface. Calibrated wheel-based odometry and gyroscopes. Combined visual odometry, wheel odometry, and gyroscope data into a Kalman filter for accurate movement tracking. Used the library, Gmapping, to create maps of environment that grow as robot explores new territory. Created an exploration mode, where robot tries to visit every part of its map, potentially making the map larger. Developed object recognition of objects of solid colors. User can tune the hue, saturation, and value ranges to allow custom object recognition. Created a mode where robot will move to a recognized object once it sees it. Once it is within arm's reach it will continually try to grab the object until it is no longer visible. It then moves to a user specified location on the map, putting the object in its designated place.
- Robot Image Draw: Wrote an algorithm to convert edges detected in an image to velocity trajectories to control a robotic arm with seven degrees of freedom. This allowed the robot to draw any image with a dry erase marker. Used a proportional controller to correct for accumulating error in the arm movement. Also created an interface for the user to draw images with the mouse, similar to Microsoft Paint. The robot draws the same image the user creates in near real-time.

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### **HONORS AND ACTIVITIES**

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- Eagle Scout of the Boy Scouts of America
  - Yoga Club, Track Team at Cornell