

# Nicholas Lanotte

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## Education

**Worcester Polytechnic Institute**

**Class of 2019**

- Robotics Engineering and Electrical and Computer Engineering Double Major
- Cumulative GPA 3.90/4
- Dean's List for Fall Term 2015 through Fall Term 2018
- Member of Tau Beta Pi – Engineering Honors Society
- Secretary of Eta Kappa Nu – Electrical Engineering Honors Society

## Work Experience

- Engineering Internship at Columbia Tech - Summer 2017 and 2018

## Projects

- **Robotics Projects** from RBE 1001, 2001, 2002, 3001 and 3002  
In every robotics class in the RBE sequence, I took the role of leader on the team, contributing significantly to all 3 components of robotics where applicable, and doing most, if not all, of the programming. In RBE3001 and RBE3002 where most of the class was programming, I usually completed most of each hands-on lab assignment on my own and added extra functions when possible. The projects of the higher-level classes include using MATLAB to control a 6-degrees of freedom robotic manipulator using computer vision feedback to manipulate objects and enabling robots to navigate and map an area using ROS and SLAM.
- **FPGA Design - ECE 3829**  
Designed logic circuits for an FPGA to do a variety of tasks including creating a function generator, driving an VGA display, reading outputs from an ADC, and implementing the MicroBlaze processor for more complex tasks like serial output. The class taught the importance of creating circuit modules so that previous project components could be used in future projects. This allowed each lab in the course to build off each other, resulting in the final project incorporating the VGA display driver and MicroBlaze processor to perform a variety of tasks like display messages on serial output, display simple images on the VGA display and validate string inputs. This experience taught me how to incorporate microprocessors and logic circuits together to solve a complicated problem on a single FPGA.
- **Software Engineering Project**  
I worked on a team of 9 in competition with other teams to create a software application for Brigham & Women's main hospital campus applying Agile methodologies. This application included pathfinding throughout the hospital, a map builder, hospital service requests and a heat map showing the hallways most travelled. As an additional feature, I worked with 2 other robotics majors to incorporate a Turtlebot 2 to interface with the application to path find through a WPI building. I designed a UI that communicated with the ROS Packages for pathfinding, allowing the user to select a location on screen. Google voice to text was used so that the user could command the robot through speech. The robot would move to the desired location and return to the entrance of the building once the user no longer

needed assistance. I was the assistant lead engineer, specializing in the UI for most of the application as well as the robot interface. I also helped gather software requirements through surveys and interviews, creating user stories, storyboards and scenarios. Our team placed 1<sup>st</sup> during the third revision of the application, and 2<sup>nd</sup> during the fourth and final revision. We also won second best feature during the second revision with our automated calling/texting system for service request, best feature with the robot in the third revision, and second-best feature with the robot in the fourth week.

- **Columbia Tech Internship**

- Summer 2017 Project – Designed a curing chamber for an SLA 3D printer for internal use at Columbia Tech. I created a SolidWorks model, electrical schematics and programmed an Arduino to automate the curing process. The Curing Chamber needed to be able to heat the inserted 3D print up to 80 degrees Celsius and irradiate it with UV light to allow the 3D print to obtain its best physical properties. The Curing Chamber had buttons, knobs and an LCD screen to select the time and temperature the print needed to be cured for. The Chamber would then automatically heat up to the given temperature and wait for the print to be inserted. Once inserted, the Curing Chamber will run for the designated amount of time, finally shutting off and cooling down. As a safety feature, if the door was opened, a hardware switch would turn off the UV lighting and the timer would pause. I had to prepare for Preliminary and Critical design reviews before my design could be built. I also had to create proper testing documentation and conduct the tests.
- Summer 2018 Projects – Columbia Tech is a manufacturer with an engineering department to assist other companies. Last summer I helped them with customers involved with Metal 3D printing and Radio Repeater systems for skyscrapers in New York. I helped develop Work Instructions, aided in solving manufacturing problems as well as some assembly of each system.

- **Demining Autonomous System – Major Qualifying Project**

- Currently in progress – My team is outfitting a ClearPath Husky A100 to detect and mark the PMN family of landmines. My contribution has been implementing a metal detector and Infrared Camera for landmine detection, the design and construction of the structure housing these sensors, writing the software to control the suite of sensors on board as well as implementing obstacle avoidance for the navigation. The software is split between C++ programming on Arduino and python programming for ROS. The project is scheduled to be completed in April.

## **Skills**

### **Programming**

C/C++, Racket, Java, JavaFX, Java DB, Python, MATLAB, Vivado, ROS, HTML, Arduino

### **Computer Programs**

MathCAD, Maple, SolidWorks, Windows, Mac OS, Linux OS, LabView, Microsoft Office, LoggerPro, GitHub, Travis CI, Gradle, IntelliJ, PyCharm, Eclipse

### **Other**

Agile Methodologies, Digital Circuit Design, Circuit Trouble Shooting, Position and Velocity Analysis, Motor Analysis, Sensor Calibration, Machine shop (laser cutter, drilling, soldering, sawing, hand tools).

## **Activities/Hobbies**

- Weightlifting
- Long distance running
- 3D printing and 3D printer design