

SANTIAGO VIVANCO

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Robotics Engineer with hands-on mechanical, computer and electrical engineering experience in robotics design, robotic technology, sensor fusion, A.I, and robotic automation system integration and development. Additional skills include development of computerized manufacturing specifications, new product refinement, device failure analysis and strong analytical and statistical reasoning skills in broad multidisciplinary system design, control, and production.

TECHNICAL PROFICIENCIES

Software Skills: ROS, Unity3D, MATLAB, Simulink, SolidWorks, AutoCAD, LabVIEW, Java, Microsoft Office, CES, Slicer, Cura, Simplify3D, Arduino, Raspberry Pi, Code Compressor Studio, C, C++, C#, Python

Electronics: Circuit design & prototyping; Interface & integration – sensors, user interface & display systems, power regulation systems, wireless communication, microcontrollers, single board computers

Instrumentation: Oscilloscope, multimeter, function generator, 3D printing, machining, soldering

EDUCATION

Bachelor of Science in Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA *Dec 2016*
Concentration in Automation and Robotic Systems. Certificate in Control of Mobile Robots

Specialization in Robotics, University of Pennsylvania, on Coursera *Jan 2017*

TECHNICAL PROJECTS

Capstone Final Project, Robotics Specialization: *Start 2016 - Jan 2017*

Built an autonomous rover capable of navigating complex environments given a map, as well as avoiding obstacles.

- **Path Planning:** Programmed and implemented an algorithm that determines the fastest possible route to a destination while considerably avoiding obstacles in an environment.
- **System Control:** Designed and programmed a PID controller that accounts for motor dead zones and velocity thresholds, calculated optimal velocities needed to reach a goal position as well as maintaining maximum stability.
- **State Estimation & Sensor Fusion:** Programmed an Extended Kalman filter which determines the robot's current location from the combined on-board sensor data (9-axis IMU and video camera). Used probabilistic methods to validate each sensor reading resulting in a considerable improvement in accuracy of position estimates.

Senior Design (Capstone Project) with MAPSAN: *Jan 2016 - May 2016*

Developed an autonomous drone capable of determining the population of dynamic underdeveloped areas.

- **System Control & Simulation:** Created a flight algorithm to capture a complete overhead view of the desired location by taking a series of pictures along the flight route substantially improving the traveling optimal route. Validated the drone by simulating take offs, landings, flight paths and safety procedures.
- **Power System Design:** Wiring, programming, power system design, and safety feature design resulting in a 40% reduction of power waste from on board single board computer and increasing maximum flight time considerably.
- **Technical Documentation:** Wrote technical specifications, models, user requirements, function specifications, detailed user specifications and created technical drawings and CAD which lead to an effective design.

Biped / Mobile Humanoid Robot Project: *Jun 2015 - Present*

Designed and manufactured a prototype of a humanoid biped robot capable of morphing into a mobile robot.

- **Mechanical Design & CAD:** Designed, prototyped and manufactured mecanum wheels for the mobile robot which considerably increased the range of mobility and direction from vertical to as well as horizontal movement.
- **Prototyping:** Applied knowledge of the 3D printing manufacturing process to create custom fabrication settings, which maximized mechanical properties as well as compensated for thermal shrinkage to meet required tolerances.
- **System Design:** Created a unique mechanical gear drive system to allow the biped to transform to a mobile rover.

LEADERSHIP ROLES

Robocup Team, RoboJackets *May 2014 - Dec 2016*

- Organized mechanical inventory of the latest soccer playing fleet which considerably increased productivity.