

Roberto Shu

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OBJECTIVE	Pursue a PhD degree in the area of controls applied to highly dynamical systems specifically legged system and address the current issues handling multiple unknown impact forces	
EDUCATION	Carnegie Mellon University – Pittsburgh, PA M.S., Robotics Advisor: <i>Asst. Professor Koushil Sreenath</i> Coursework: Geometry of Locomotion, Biomechanics & Motor control, Dynamic Optimization	Graduation Date: May 2016 GPA: 4.0 4.3
	University of Michigan – Ann Arbor, MI B.S. Mechanical and Aerospace Engineering (Double Major) Minors: Mathematics and Multi-disciplinary Design Grad Coursework: Automatic Control, Probability, Modern Algebra	May 2014 GPA: 3.2 4.0
RESEARCH EXPERIENCE	Hybrid Dynamic Robotics Lab Advisor: <i>Assistant Professor K. Sreenath</i>	Nov 2014 - Present
	<ul style="list-style-type: none">• Prototyped novel human size robotic leg for a biped with active damping via M.R. damper and non liner compliance to withstand the high impact force of landing high jumps• Simulated mathematical model of proposed leg design in SimMechanics, and implemented quadratic programming to find optimum parameters, damping and joint profiles• Developing position control for Nano Quadrotor & created a native Simulink client for communication with hardware	
	Biologically Inspired Robotics and Dynamical Systems (BIRDS) Lab Advisor: <i>Assistant Professor S. Revzen</i>	May 2013 – May 2014
	<ul style="list-style-type: none">• Designed, built, and tested new generation of self-assembling modular robotics with expandable polyurethane foam (FoamBots) controlled via custom python software• Redesigned autonomous foam reagents mixing device and peristaltic pump manufactured only with a laser cutter that assembles without screws or permanent joints	
	Alignment Platform for Multilayer Microfluidic devices Advisor: <i>Associate Professor J. Fu</i>	Sep 2013 – Dec 2013
	<ul style="list-style-type: none">• Designed custom desktop aligner capable of both local and global alignments of PDMS layers covering a broad size range for microfluidic device manufacturing	
	Michigan Hybrid Racing (MHybrid) <i>Aerospace Team Lead</i>	Sep 2012- May 2014
	<ul style="list-style-type: none">• Conducted comprehensive computational fluid dynamics (CFD) analysis of car body, validated CFD model by refining the grid convergence and considering turbulence models• Manufactured car body that reduced car's coefficient of drag and lift by 30% and 10% respectively from previous year, and undertray that generated 35lbs of down force	
LEADERSHIP EXPERIENCE	Society of Hispanic Professional Engineers (SHPE) <i>President (Certified Chapter Leader for SHPE)</i>	Apr 2012 –May 2013
	<ul style="list-style-type: none">• Led chapter to win the 2013 SHPE National Chapter of the Year Award, Outstanding Regional Chapter for the 1st time and 2nd consecutive Blue Chip Award• Tripled chapter size to 60+ active members, and materialized 6 new programs including 2 outreach programs in Southwest Detroit and Costa Rica	
SKILLS	Software: GNU/Linux, SolidWorks \& SW Simulation, NX Unigraphics, Autodesk Inventor, XFlow Programming: MATLAB/Simulink/SimMechanics, C++, C, Python, ROS, Bash Hardware: OptiTrack Prime 17W, CrazyFlie Quad-rotor, Dynamixel, Frameless Brushless DC motors Manufacturing: Mill, Lathe, CNC Router, Laser cutting, Composite material layout	
AWARDS	Scholarships University of Excellence Scholarship for graduate studies (\$150,000) University of Excellence Scholarship for undergraduate studies (\$130,000)	
	Awards 2013 Stellar Multicultural Performance Award • 2014 Dean's MLK Spirit Award • 2012, 2013, 2014 Undergraduate Achievement Award • 1st place Case Study, National Institute for Leadership Advancement	