Matthew A. Estrada

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Education

Stanford University: Stanford, CA

Ph.D. Candidate, Mechanical Engineering	GPA 3.7/4.0	**Expected 2018**
M.S. Mechanical Engineering		**April 2015**

Massachusetts Institute of Technology: Cambridge, MA

B.S. Mechanical Engineering	GPA 4.7/5.0	**June 2012**

Research Experience

Stanford Biomimetics and Dexterous Manipulation Lab – Ph.D. Candidate   **Fall 2012 – present**

·   Created gecko-inspired adhesive gripper for manipulation of curved objects in micro-gravity environments. Wrist compliance allowed for of grasping objects with misalignment and relative velocity. Modelled dynamics and successful grasping conditions for gripper, validated with experiments under motion capture system.
  "*Free Flyer Acquisition of Spinning Objects with Gecko-Inspired Adhesives*," **Estrada**, Hockman, Bylard, Cutkosky, Pavone (ICRA 2016)

·   Created lightweight robot capable of dynamically perching on vertical glass and climbing.
    o   Implemented PD control for active reorientation via inertial appendage during ballistic phase.
  "*Perching and Crawling: Design of a Multimodal Robot,"* **Estrada**, Hawkes, Christensen, Cutkosky; (ICRA 2014)

Laboratory of Intelligent Systems, EPFL, Switzerland – Visiting PhD Student   **Sept 2016 – June 2017**

  Created a 100 gram aerial robot with controllable adhesives, allowing it to tug up to 4 kg, depending on substrate. Coordinated two robots to demonstrate opening a door.
  In Prep: "*Forceful Manipulation with Micro Air Vehicles,"* **Estrada**, Mintchev, Christensen, Cutkosky, Floreano

MIT Biomimetic Robotics Laboratory – Undergraduate Researcher   **Winter 2010 – Spring 2012**

·   Developed physical structure of novel force sensor to integrate within footpad of running, robotic cheetah platform. Included layered casting of polymers and embedded woven fibers for strength
·   Designed and built the lab's experimental gantry for testing planar bounding of robotic cheetah leg

Design Course Projects

Smart Product Design –M.S. Depth Curriculum (Stanford ME218)   **Fall 2012 – Spring 2013**

·   Three-quarter, project-based graduate course on prototyping embedded systems in teams of four.
·   Designed and constructed a remote-controlled robot to handle wireless commands using an event-driven software framework and a SPI communication network between PIC chips.
·   Constructed autonomous robot to navigate 10'x10' playing field shooting opponent's targets in a final tournament

Precision Machine Design – Senior Capstone Design Course (MIT ME 2.750)   **Fall 2011**

·   Worked with a student team of five, advised by a surgeon, to develop the SutureTie, a hand-held device that used zip-tie sutures to occlude blood flow through discrete sections of the liver.
·   Team produced a proof-of-concept prototype which was demonstrated on an ex-vivo, porcine liver

Awards

2016	Swiss Government Excellence Scholarship for Foreign Scholars
2014	Finalist-Best Conference Paper, International Conference on Robotics and Automation (ICRA 2014)
2012	National Science Foundation Graduate Research Fellowship
2012	2nd place MIT DeFlorez Undergraduate Design Comp

Technical Skills

·   **Embedded Systems Design**: PIC and Arduino microcontrollers
·   **Modeling/Programming**: SolidWorks, C++, C, MATLAB, MotionGenesis
·   **Manufacturing:** Rapid prototyping on 3D printer, lasercutter, waterjet. Experience on lathe, CNC mill
·   **Theory Courses**: Convex Optimization, Introduction to Robotics, Advanced Dynamics and Computation