Stephanie Lace Chang

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https://stephanniec.github.io/stepholio/

Education

Northwestern University
Master of Science, Robotics | GPA **3.91**/4.0 — Expected Dec 2017

University of California, San Diego (UCSD)
Bachelor of Science, Bioengineering: Biotechnology | Major GPA **3.74**/4.0 — June 2015

Research Experience

Phantom Omni Driven Control of a Robotic Arm | GitHub Repository — Jan 2017 - Present

- Developed a sensitive user interface which allows users to smoothly manipulate the trajectory of a robot arm using the Phantom Omni
- Created a ROS node network which employs Newton-Euler dynamics and least-squares damping to compute the joint velocities needed to move the arm to a desired pose
- Working on integrating haptic feedback which will allow users to feel forces applied to the robot arm in real-time

Baxter Plays Checkers | GitHub Repository — Dec 2016

- Built a ROS Python package which grants a commercially available robot (Baxter) the ability to play checkers
- Developed a node network which computes valid moves using checkers logic, performs inverse kinematics to move a seven degree of freedom arm towards a desired position, selects only for red checkers pieces using OpenCV, and corrects the robot's end-effector position using proportional control

Modeling Rigid-body Dynamics — Dec 2016

- Simulated the behavior of nonlinear mechanical systems using Lagrangian dynamics in Mathematica
- Investigated how impacts, rotational inertia, and applied external forcing affect the movement of free and constrained multi-link rigid bodies

VIRA, Engineering World Health at UCSD — Oct 2011 – Oct 2015

- Designed a semi-automated anti-retroviral drug resistance screening system for the Eduardo Mondlane University Hospital in Mozambique for less than $500 ($7 per test)
- Lead the manufacturing process for the alpha prototype of a pneumatic, RNA extraction device which precisely meters volumes ≥50μL
- Authored a paper on the benefits of using blood pooling to lower the cost of HIV diagnostic tests (PMC4607635)

Work Experience

Life Science Research Professional I, Stanford University (Palo Alto, CA) — Jan 2016 – Aug 2016

- Fabricated epicardial collagen patches, which facilitate heart muscle repair following myocardial infarction, for clinical studies using mice and swine
- Conducted quality control tests to ensure patches were suitable for transplantation into mammals via catheters

Lab Technician I, Sanford Burnham Prebys Medical Discovery Institute (La Jolla, CA) — Aug 2015 – Dec 2015

- Modulated the composition of fluorescent biosensors, developed during a previous internship, to improve their sensitivity to endogenous microRNA fluctuations in healthy and stressed rat neonatal ventricular cardiomyocytes

Intern, Sanford Burnham Medical Research Institute (La Jolla, CA) — Oct 2014 – June 2015

- Identified microRNA species which are differentially regulated in healthy and hypertrophic cardiomyocytes
- Created a set of novel mRNA biosensors that, when transfected into cells, fluorescently detect for mechanical and norepinephrine-induced stretch in cardiomyocytes

Relevant Skills and Coursework

Software: Python, ROS, C, MATLAB, Mathematica, Linux, Git, Solidworks, V-REP, Gazebo, Bash, OpenCV, HTML/CSS
Microbiology: Cell Culture, DNA/RNA/Phenol Extraction, RT-qPCR, Gel Electrophoresis, Transfection, Transformation, Subcloning, Hydrogel Fabrication, Atomic Force Microscopy, Immunofluorescence Staining, Spectrophotometry
Hardware: Mechatronics, 3D Printing, Laser Cutting

Honors and Awards

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Best Undergraduate Research Poster, UCSD Bioengineering Day	April 2015
Gordon Engineering Leadership Scholar	July 2014
2nd Place, Engineering World Health National Design Competition	October 2012