

Stephanie Lace Chang

stephannielacechang@gmail.com | (408) 507-3010 | <https://stephannielacechang.github.io/stepholio/>

Education

Northwestern University

Master of Science, Robotics | GPA **3.96/4.0**

Dec 2017

University of California, San Diego

Bachelor of Science, Bioengineering: Biotechnology | Major GPA **3.74/4.0**

June 2015

Skills

Software	Python, ROS, C, C++, MATLAB, Mathematica, Linux, Git, V-REP, Gazebo, OpenCV, and Android Studio
Prototyping	SolidWorks, NX, Mechatronics (electromechanical design, microcontroller programming), 3D Printing (Polyjet, Fused deposition modeling, Powder bed and inkjet), Laser Cutting, Laser Scanning, and CNC Milling
Wet Lab	Nucleic acid purification (DNA/RNA/Phenol), RT-qPCR, Gel Electrophoresis, Bacterial Transformation and Transfection, Subcloning, Immunofluorescence Staining, Spectrophotometry, and Atomic Force Microscopy
Knowledge of	Rigid-body Dynamics (Lagrangian, Newton-Euler), Linear and Nonlinear Optimal Control, Machine Learning, PCB Design, Biomaterials, and Statistics

Prototyping Projects

3D-Printed Smartphone Case

Sept 2017 – Dec 2017

- Fabricated a flexible protective case for the Samsung Galaxy S3 out of hybrid plastics via PolyJet printing
- Modeled the case in SolidWorks around a laser scan of the phone rendered using Geomagic Design X
- Refined the fit, usability and durability of the design after subjecting each iteration to stress testing and gathering peer feedback

Burrowing Robot

Mar 2017 – Dec 2017

- Designed a novel modular robot which uses helical motion to travel horizontally within granular media
- Derived a theoretical model that describes how the parameters of a mounted auger and granular material characteristics can affect the amount of propulsive force generated
- Verified the model by testing numerous 3D-printed iterations of the robot in a bed of poppy seeds

Android Controlled Path-Following Robot

June 2017

- Created a differential drive robot that can steer around a racetrack
- Programmed a PIC32 microcontroller using C to modulate the velocity of two wheels
- Implemented an Android application for pathfinding via real-time image parsing and USB CDC communication with microcontroller to keep robot centered
- Built a housing unit out of laser cut acrylic and 3D-printed PLA to secure custom circuitry

Teleoperated Robotic Arm

Jan 2017 – May 2017

- Developed a ROS package in Python which allows users to manipulate the trajectory of a 7-DOF robot arm using a Geomagic Touch haptic device
- Implemented a joint velocity controller with selective least-squares damping for accurate task space control

Checkers Playing Robot

Dec 2016

- Built a ROS package in Python which grants a humanoid robot the ability to play checkers
- Developed a node network which computes valid moves, performs inverse kinematics to move a 7-DOF arm to a target position, distinguishes the robot's checkers pieces using OpenCV, and employs visual servoing to correct the end effector's movements

Cost-Effective HIV Viral Load Monitoring Device

Oct 2011 – Oct 2015

- Project awarded 2nd place for submission to the 2012 Engineering World Health National Design Competition
- Co-lead 24 engineers in designing a semi-automated anti-retroviral drug resistance screening system for the Eduardo Mondlane University Hospital in Mozambique
- Achieved goal of building a viral load monitoring system that costs less than \$1,000: resulting system costs less than \$500
- Lead 8-membered sub-team responsible for manufacturing the pneumatic RNA extraction device
- Secured more than \$16,000 of funding through grants and competitions

Stephanie Lace Chang

stephannielacechang@gmail.com | (408) 507-3010 | <https://stephannielacechang.github.io/stepholio/>

- Partnered with lab technicians from UCSD's School of Medicine to verify efficacy of prototypes

Work Experience

Life Science Research Professional I, Stanford University School of Medicine (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 robust enough for transplantation
- As the acting lab manager, coordinated with material suppliers, lab equipment vendors, and Environmental Health and Safety inspectors to support five cardiology projects in Dr. Mark Mercola's lab
- Drafted floor plan for and organized set up of lab's new space at Stanford's newly constructed Technology and Innovation Park

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
- Synthesized a set of novel mRNA biosensors that, when transfected into cells, fluorescently detect for mechanical and norepinephrine-induced stretch in cardiomyocytes

Posters and Publications

Pooled Nucleic Acid Testing to Detect Antiretroviral Treatment Failure in HIV-Infected Patients in Mozambique Nov 2015

- Paper published in the Journal of Acquired Immune Deficiency Syndromes

April 2015

Biosensor for Stretch in Cardiomyocytes

- Awarded Best Undergraduate Research Poster
- Poster presented at UCSD Bioengineering Day