# Stephanie Lace Chang

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## Education

**Northwestern University**
Master of Science, Robotics | GPA **4.0**/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

**Baxter Plays Checkers** — 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

**Microfluidic Paper-based Genetic Circuits**, Engineering World Health at UCSD — Aug 2015 – Dec 2015

- Designed and verified the efficacy of mRNA toehold switches which target conserved HIV sequences

**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
- Implemented quality control testing with Epikabio's Chief Scientific Officer 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/C++, MATLAB, Mathematica, Linux, Git, AutoCAD, 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
**Classes**: Mechatronics, Theory of Machine Dynamics, Introduction to Feedback Systems, Robotic Manipulation

## Honors and Awards

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