

JOANA P. CABRERA

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EDUCATION

University of California, Berkeley

[Expected: May 2018]

Bachelor of Science: Bioengineering (Biomedical Devices Concentration)

Minor: Electrical Engineering and Computer Science

TECHNICAL

Languages and Software: Solidworks, Autodesk Inventor, Mastercam, Arduino, Python, Java, Git, MATLAB

Manufacturing: CNC Mill, Lathe, Router, Laser Cutter, 3D Printer

Laboratory: Tissue Culture, Cadaver Dissection

EXPERIENCE

Engineering Intern | Taylor Collaboration

[January 2017 – Present]

- Designed and manufactured a testing apparatus that measured the tensile strength of the various allograft options for anterior cruciate ligament (ACL) reconstruction
- Created a database for calculating statistics of resident orthopedic surgeons' mastery of surgical skills
- Assisted in the cadaver dissection and in various orthopedic surgeries with residents of St. Mary's Medical Center

Undergraduate Researcher | Herr Lab at UC Berkeley

[August 2014 – May 2016]

- Designed, programmed, and fabricated a microscope-integrated thermocycler for microfluidic chips
- Optimized synthesis of polydiacetylene vesicles as temperature and pH indicators by altering component ratios
- Developed and manufactured a light guide adaptor to prevent ultraviolet leaks from an ultraviolet light source

Project Manager | CAMS Engineering Design and Development Course

[August 2013 – June 2014]

- Directed a team of 20 high school students in the design and manufacturing of an ophidian reconnaissance robot
- Monitored and orchestrated the development of the ophidian robot to ensure compliance of product requirements
- Coordinated the seamless integration of the mechanical, electrical, and control subsystems of the ophidian robot

Chairwoman | CAMS FIRST Robotics Team (687)

[August 2012 – June 2014]

- Managed a team of 50 students in the design and fabrication of competition robots that engage in an annual challenge to be completed within a time frame of 6 weeks
- Received 3 consecutive entrepreneurship awards at regional competitions and competed in World Championships

PROJECTS

ACL Tensile Strength Testing Apparatus

- Incorporated a modular design compatible with the Instron Tensile Tester for flexibility in testing procedures
- Utilized material properties of human tissue to ensure the adherence of the soft tissue to the testing apparatus
- Created a methodical testing procedure to ensure accurate and replicable results for each cycle of testing

Paraplegic Computing Joystick

- Developed a mechanical controller actuated by lower lip movements to cater to the client's physical capabilities
- Programmed the joystick using the Arduino to control either the client's computer or tablet
- Designed a mounting apparatus that enables the use of the joystick while the client is on or off his wheelchair

Hemiplegic Grocery Aid

- Created a product compatible with an electric wheelchair that enables the user to shop with little to no assistance
- Developed a non-intrusive pivot mechanism that allows the client to shop with two children on her lap

Microscope – Integrated Thermocycler

- Enabled the simultaneous imaging and thermal cycling of a microfluidic chip for polymerase chain reaction (PCR)
- Utilized the conductive properties of indium tin oxide to propagate current through glass and increase its temperature through resistive heating
- Achieved a heating precision of $\pm 2^\circ\text{C}$ within designated temperature and a heating rate of 1°C/s

Ophidian Reconnaissance Robot

- Successfully created an ophidian robot capable of artifact intake, heat sensing, and 3D mapping its environment
- Designed self-suspending wheels made of Delrin, enabling the robot to easily adjust to various types of terrain
- Implemented a compartmental system with omni-directional joints to simulate the flexibility of ophidian movement