NATALIA PEREZ TRIANA
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Education

University of California, Berkeley - G.P.A.: 3.425 (Cumulative 3.640) *December 2020*
B.S. Mechanical Engineering

City College of San Francisco - G.P.A.: 3.78 *May 2018*
Mechanical Engineering – A.S.T. Physics and Mathematics

Relevant Coursework

- Vehicle Dynamics & Controls
- Mechatronics Design
- Mechanical Behavior of Engineering Materials
- Heat transfer and Thermodynamics
- Engineering Drawing, Manufacturing, and Tolerance (GD&
- Dynamic Systems and Control Design
- Unmanned Aerial Vehicle (UAV) Systems
- Engineering Mechanics – Statics
- Engineering Mechanics – Dynamics (Intermediate)
- Circuit Analysis

Skills

- Manufacturing – Milling, drilling, laser-cutting, water-jet cutting, and 3-D printing.
- Hardware – Electric circuit analysis and mechatronics design.
- Software – SolidWorks, Fusion360, MATLAB/Simulink, LaTeX, Python, C/C++, ROS, and Ansys.
- Linguistics – English (fluent), Spanish (native), German (elementary), French (elementary).

Relevant Experience

Research Assistant, High Performance Robotics Lab (HiPerLab), UC Berkeley *August 2019 – Present*
The first iteration of the project was successfully submitted and accepted to IROS 2020. Currently working on a larger and more efficient tensegrity design.

- Design a new mounting approach and new string tensioning mechanism to account for energy dissipation during collision.
- Conduct research for secure and energy efficient design of an icosahedron tensegrity structure for collision resistance in UAVs.
- Perform stress analysis to design end cap holders for the rods in the collision resistance structure, resulting in an overall improved structure demonstrated by experimental data.
- Analyze materials and achieve to cut the weight by half compared to the previous iteration and to make the structure survive with speed up to 6.5 m/s.

Grader, Introduction to control of unmanned aerial vehicles, UC Berkeley *August 2020 – December 2020*

- Course reader in introductory to control of unmanned aerial vehicles where I was responsible for evaluating and recording labs, assignments, and exams.

DeCal Facilitator, Competitive Robotics: Iterative Design & Mechanical Prototyping, UC Berkeley *Fall 2019 / Fall 2020*

- Taught the fundamentals of designing, building, and adding micro-controller strategies for a combat robot from novice to advanced level.
- Guided students on computer-aided design using SolidWorks to create and design components of the robot.
- Explained design procedures including materials, machining, assembly limitations and cost for better decision making.

Research Assistant, Embodied Dexterity Group (EDG), UC Berkeley *Summer 2020*

- Implemented a simplified data collection of the various materials and their properties to protect a firefighting robot.
- Applied heat transfer methodology and used Ansys to verify material selection.
- Configured a thermocouple type-K using an Arduino to read and record the temperature readings during experiments.
- Constructed and tested a homemade layer combination of materials that successfully survived experiments.

Projects

Legged Robot *Fall 2020 - Present*
The first iteration of this robot had only two legs and used IoT to be controlled from the phone. Currently working on designing a second iteration of this project by making it a quadruped for easier exploration.

- Worked on the construction of a legged robot using linkages analysis.
- Applied control knowledge using Arduino programming to change the desired angular speed at which the legs needed to move.
- Implemented a servo motor that could be controlled via WiFi module to change the direction of the robot.

Beetleweight Combat Robot - Katzy, UC Berkeley Premier Robotics Organization *Spring 2020 - Present*

- Designed and manufactured a combat robot for the National 3-lb Combat Robotics competition.
- Manufactured and assembled parts for the robot body using the waterjet cutter, drill press, 3D printer, and laser cutter.
- Searched and analyzed for the most secure, efficient, and light weight design and materials for the robot.

Unmanned Aerial Vehicle, UC Berkeley *Fall 2019*
Worked with a UAV to apply general commands and to prepare the vehicle for a final competition.

- Programmed and designed a proportional-integral feedback controller in C++ to make the vehicle fly at a required height and managed to land in a desired position.
- Applied 3D modeling of vehicle dynamics, rotations, estimators, and sensors to implement the necessary controller.

Additional

- Vice-president, RoboBears, UC Berkeley *May 2019 – December 2020*
- Publication: Jiaming Zha, Xiangyu Wu, Joseph Kroeger, Natalia Perez and Mark W. Mueller. “A collision resilient aerial vehicle with icosahedron tensegrity structure.” IROS 2020.