Bianca Champenois

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Education

University of California, Berkeley — B.S. Mechanical Engineering, 3.91 GPA   Aug 2016 - May 2020

Relevant Coursework:

Mechanics, Dynamics, Fluid Mechanics, Thermodynamics, Heat Transfer, Dynamic Systems and Feedback, Finite Element Analysis, Energy Conversion Principles, Mechatronics, Robotics, Legged Robots, Bioinspired Design, Three Dimensional Modeling and Design, Manufacturing and Tolerancing, Programming for Engineers, Structure and Interpretation of Computer Programs, Information Devices and Systems, Data Structures, Data Science.

Work Experience

DAAD RISE / Research Assistant (Technische Universität Hamburg, Germany)   May 2019 - Aug 2019

Wrote control and reinforcement learning algorithms to maximize the power output from an Acrobot pendulum that is vertically excited by ocean waves. Used LabVIEW and Raspberry Pi to collect data on the performance of the pendulum.

Envtl. Fluid Mechanics and Hydrology Lab / Research Assistant (UC Berkeley)   Jan 2019 - PRESENT

Set up instruments and experiments to study the effect of surface flow on methane emissions from wetlands. Used Raspberry Pi to collect data on the relationship between the flow velocity and the rate of diffusion of gases.

Cal Energy Corps / Research Assistant (Tecnológico de Monterrey, México)   May 2018 - Aug 2018

Designed PCBs for power converters for renewable energy integration. Selected and assembled passive and active components for circuits. Tested the converter and gathered data on its performance at high voltages and currents. Used LabVIEW to simulate the converter and design controllers to adjust the duty cycle of the circuit.

BicyCAL / Head Mechanic (UC Berkeley)   Oct 2017 - PRESENT

In charge of running and maintaining a student-run bike shop, leading repairs and teaching customers how to fix their own bikes. Held weekly workshops for women to learn in an inclusive environment. Organized and taught a semester long class with lectures, worksheets, and assignments on bike repair and maintenance. Mentored students at Richmond High School through the process of building an electric bike for a competition.

Activities and Projects

Mâché Machine, the Paper Downcycler   Aug 2019 - Dec 2019

Designed and built a mechatronic control device that produces new sheets of paper from recycled paper pulp. The aluminum machine uses stepper motors and pneumatic actuators to poor the pulp onto a screen, compress the pulp under a roller, flip the sheet of paper onto felt, and dry it. Finalist for CA Mechanics Design for Greater Good competition.

Mölkky Baxter, the Lawn Game Playing Robot   Oct 2019 - Dec 2019

Used ROS to enable a two-armed Baxter robot to play Mölkky, a Finnish lawn game. Used computer vision to allow Baxter to see the game board. Developed probability-driven strategy algorithms to maximize the score based on the position of the game pieces. Used path planning and inverse kinematics to launch pin at correct angle and height.

Genetic Optimization for Cassie Robot Running   Oct 2019 - Dec 2019

Used the genetic optimization toolbox in MATLAB with Simulink models of Cassie robot to calculate the joint torques for best running gaits. Tested effects of different constraints on system. Compared results to collocation techniques.

Jacobs Institute Innovation Catalysts Spark Grant: Binary Marbles   Jan 2019 - May 2019

Designed and manufactured a binary calculator that uses mechanical gates and marbles to represent electrical transistors and current. The final product teaches anyone interested in computer science about binary, computer architecture, abstraction, and logic in a unique and interactive way. Presented project at the Futures of Academic Making symposium.

Solar Spring Break / Fundraising Leader   Aug 2016 - May 2017

Led a team of 12 students to raise $5,000 for Grid Alternatives. Installed solar panels on underserved Richmond residences over spring break while learning about the renewable energy industry.

Skills and Awards

Technical: Python, Java, MATLAB, ROS, Pandas, AutoCAD, SolidWorks, Fusion, KiCad, Machine Shop Trained.

Language: Fluent in French and Spanish.

Awards: Aptiv Future of Mobility Scholarship (2018), Chevron Scholarship (2017), MIT Leadership Award (2016)