

# Jack Lucas

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## EDUCATION

San Diego State University, College of Engineering  
*Master of Science in Mechanical Engineering*

**May 2020**  
GPA 3.2/4.0

Binghamton University, State University of New York, Thomas J. Watson School of Engineering  
*Bachelor of Science in Mechanical Engineering, Minor in Sustainable Engineering*

**May 2018**  
GPA 3.0/4.0

## TECHNICAL SKILLS

**Computer:** CAD, PTC Creo, SolidWorks, ANSYS, COMSOL, MATLAB, Minitab, Biopac Adobe

**Laboratory:** Raman Spectroscopy, IR Spectroscopy, 3D Printing, Electrochemistry (EC Lab), Glove Box

**Language:** English, Proficient in Spanish

**Certifications:** OSHA- Safety

**Summer 2017**

## RELATED EXPERIENCE

**San Diego State University, Interface Design Lab**

**Fall 2018-Present**

Next-Generation Battery Research

- Conduct experiments on lithium metal batteries to improve the life cycle, storage capacity, and durability
- Design creative solutions to degrading aspects of batteries and innovate next-generation battery technology
- Analyze the surface chemistry of lithium electrodes during In-Situ experiments using Raman Spectroscopy and IR Mapping
- Develop a thorough report and presentation to defend my thesis at the end of the program

**San Diego State University, Finite Element Methods**

**Spring 2019**

- Modeled the effects of unique separators on the reactions occurring at lithium electrodes in a battery using COMSOL
- Analyzed chemical species transport across different separator pathways to see the changes in reaction rates

**Binghamton University, Mechanical Engineering Design**

Senior Design Project

**Fall 2017-Spring 2018**

- Lead a cohesive team of 6 students on a NYSID funded year-long project to double the output capacity of the AVRE paper facility and in turn double profits and jobs for their rehabilitation center
- Designed a piston-powered door connected to an Arduino to alternate levels of operation to increase the available output
- Implemented sensors and programmed Arduino to ensure swift communication between the piston, Arduino, & user interface
- Created touch screen user-interface that caters to the employees of AVRE who are mostly legally blind
- Awarded First Place at the NYSID CREATE competition held in Albany, NY for our design and deliverable

Junior Design Project- Increase truck energy efficiency

**Spring 2017**

- Created a design of a 3 horizontal-turbine system to replace a truck grille to increase truck efficiency and battery power
- Analyzed the wind drag and the harnessed power to test the effectiveness of the new design
- Used Creo and ANSYS to analyze the stresses, strains, and safety factors of the system under a 220mph wind load

## EXPERIENCE

**SDSU Industrial Assessment Center, Energy Engineer**

**Fall 2018-Present**

- Audit companies in Southern California with a team of students and provide them with an energy assessment of their facility
- Create assessment recommendations to help increase energy efficiency, decrease energy use, and decrease cost
- Compile a comprehensive report with energy and cost analysis of various improvements that the company can introduce

**Viejas Arena, Operations Assistant**

**Fall 2018-Present**

- Assist maintenance engineers in fixing electrical and mechanical issues to maintain the two venues
- Make sure the venues are ready for events and assist in upgrading the facility's lighting, seating, and infrastructure

**Con Edison, Queens Construction Management Gas**

**Summer 2017**

- Analyzed data to track pipe fuses across Queens Construction for safety in the case of leaks and to hold individuals accountable for their fuses
- Created an excel tool to educate upper management how project specialists were saving money by bundling permits
- Provided oversight with project managers at job sites in the Bronx/Queens where HPPE gas pipes were being fused

## LEADERSHIP EXPERIENCE

**Undergraduate Society for Economic Outreach, Co-Founder**

**Spring 2016-2018**

- Co-created an organization that manages a Kiva portfolio of microfinance loans to stimulate economies in poor countries
- Lead fundraising campaigns to grow the capital of the organization which will be used to provide charitable, no-interest loans to businesses in third world countries that do not have access to credit

**Sigma Alpha Epsilon, New York Omega Chapter**

**Spring 2015-2018**

- Coordinated events for the entire fraternity including an annual weekend in Canada for 150 people and recruit new members