

## EDUCATION

Valparaiso University, Valparaiso, IN

Bachelor of Science in Mechanical Engineering, Complimentary Major in the Humanities

December 2019

Christ College – The Honors College, Tau Beta Pi Engineering Honor Society

GPA: 3.936/4.0

Study Abroad: University College Utrecht, Utrecht, Netherlands

## PUBLICATIONS AND PRESENTATIONS

Silcox, R., Engerer, L.K., Nudehi, S., Smith, P., Schoer, J., Krenzke, P.T., Palumbo, R., and Venstrom, L.J., 2020, Solar thermal decoupled water electrolysis process III: The anodic electrochemical reaction in a rotating disc electrode cell, Chem. Eng. Sci. 227, 115885.

Silcox, R., Nudehi, S., Schoer, J., Larson, C., Palumbo, R., Diver, R.B., and Venstrom, L.J., (2019, July). *Electrolysis in a Hybrid Thermochemical Water-Splitting Cycle Based on Cobalt Oxide*. Presentation at the 13th annual meeting of the ASME Energy Sustainability Conference, Seattle, WA

Silcox, R., and Villagran, G., (2018, May). *Solar Thermal Decoupled Process: The Rotating Disc Electrode's Effect on Mass Transfer of Cobalt Oxide*. Presentation at the 2018 Symposium on Undergraduate Research and Creative Expression, Valparaiso, IN. <https://scholar.valpo.edu/cus/707>

## PROJECTS

Solar Thermal and Photovoltaic Residential Design Project

March - May 2019

- Sized water usage, heating load, and electricity usage for a single-family residence.
- Designed a water heater/solar thermal system and a PV panel system.
- Performed simulation, including financial analysis, of the two systems' performance using a custom MATLAB code and NREL SAM software.

Electrolysis Cell Senior Design Project

September 2018 - May 2019

- Proposed project idea and managed a team of 6 people in designing and building an electrolysis cell for production of hydrogen gas as a renewable fuel.
- Delegated responsibilities to individuals based on their specific skills and coordinated the efforts of the team.

Valpo Innovates Entrepreneurial Competition

February 2018

- Developed a concept mobile application for a bike taxi program to combat pollution in Indiana.
- Cooperated with students from different backgrounds to create a multidisciplinary approach to a greener environment.
- Awarded 1<sup>st</sup> place with a prize of \$1,000 and a local radio interview.

## WORK HISTORY

Advanced Ionics, Milwaukee, WI

October - December 2020

- Designed a comprehensive model and application in MATLAB to aid with heat exchanger design for electrolysis products.
- Built and tested alkaline electrolysis cell for benchtop testing using steam at 200-500 °C.

The Works Museum, Bloomington, MN

June - August 2020

- Engaged children in circuit and electrical engineering related design projects in person and online.
- Provided childcare as a COVID-19 Emergency Response Minnesota AmeriCorps Member.

Research Assistant, Valparaiso University, Valparaiso, IN

May 2017- December 2019

- Developed hypotheses and independently tested them in electrochemistry experiments.
- Presented results in poster and oral format, both locally at Valparaiso University and nationally at the ASME Energy and Sustainability 2019 Conference in Seattle, WA.

Grader, Valparaiso University, Valparaiso, IN

January 2017- December 2019

- Graded for Statics, Materials Science, Heat Transfer, and Measurements courses.
- Provided feedback on student homework and tips to improve problem-solving methodology.
- Held review sessions to help students succeed on exams and mentored fellow students on study skills.

Nuclear Forensics Undergraduate Summer School, University of Utah, Salt Lake City, UT

June - July 2018

- Studied the specifics of radiation and radiation detection through Oak Ridge Institute for Science and Education by visiting Uranium and Plutonium processing and test facilities.
- Interacted with experts in the field from Lawrence Livermore National Lab, Savannah River National Lab, and the Federal Bureau for Investigation.

## **SKILLS**

- MATLAB (6 years of experience, including FVM techniques)
- Microsoft Word, Excel, and Power Point
- Proficient in French (4 years of study)
- NREL SAM
- SolidWorks/AutoCAD
- MIG/TIG Welding

## **LEADERSHIP POSITIONS**

Tau Beta Pi Engineering Honor Society

April 2018 - May 2019

President of IN D Chapter: Communicated with National Headquarters, advisors, and members on a regular basis. Organized 15 college wide events for up to 200 people. Encouraged service opportunities for 45 members. Mentored students to improve grades as a leader in the College of Engineering.

Council for Engineering Inclusion and Equity

August 2017 - May 2019

Co-Founder and President: Led meetings with faculty, staff, and students to facilitate the development of 7 new programs and activities which encourage inclusion and equity in the Valparaiso University College of Engineering. Encouraged the success of all students through orientation, programming, and policy additions. Grew the size of the organization to about 30 students.

Institute for Leadership and Service

August 2016 - May 2017

Students Engaged in Reflective Volunteering Coordinator: Planned education and reflection events for student volunteers. Led events for student volunteers. Recruited new volunteers to serve at events on campus and in the community. Communicated with organizations to identify potential volunteering opportunities.

## **HONORS AND AWARDS**

Fulbright US Student

March 2020

Granted English Teaching Assistantship to Cambodia to volunteer with an environmental non-profit and promote mutual understanding.

Tau Beta Pi Scholar

May 2018

Conferred for academics, extracurricular activities, and the promise of contributions to the engineering profession.

Claire Duncan Memorial Award Winner

February 2018

Awarded for leadership in the Valparaiso University College of Engineering.