College of Engineering
UNIVERSITY OF WISCONSIN–MADISON

GRAINGER POWER ENGINEERING AWARDS

APRIL 1, 2019

Supported by a grant from The Grainger Foundation

2019
GRAINGER POWER ENGINEERING AWARDS

RECEPTION
5 P.M.
Varsity Hall III, Union South

OPENING REMARKS
5:30 P.M.
Dean Ian Robertson

DINNER

AWARDS PRESENTATION
6:15 P.M.
Dean Ian Robertson
Undergraduate and Graduate Awards

Power Engineering faculty in attendance:
Tom Jahns
Bernie Lesieutre
Dan Ludois
Line Roald
Bulent Sarlioglu
Eric Severson

ANDREW KRUCK

Ever since he was a child growing up in Mequon, Wisconsin, Andrew Kruck has sought to find out how things work. After excelling in his high school AP physics classes, he realized that power engineering offered insight into the inner workings of technologies ranging from everyday devices like smartphones and wearables to the entire massive distribution system of the U.S. electric grid.

A co-op term at the engineering consulting company Foth in De Pere, Wisconsin, further piqued Kruck's interest in engineering. During his time with the company, he worked as a controls engineer to help design control panels and power wiring for manufacturing packaging projects.

After earning his bachelor's degree in electrical engineering in May 2019, Kruck will join Foth full time as a controls engineer in the company's beverage department. He'll be working on packaging, designing control panels, and writing programs for conveyors in the facility.

As a student, Kruck has been an active member of IEEE for two years. Outside of the classroom, he enjoys hunting, fishing, golfing and watching Badger sports.

NATHAN PETERSEN

A lifelong tinkerer, Nathan Petersen took his toys apart to understand what made them work when he was a child in Austin, Texas. Now, he says, making has become central to who he is—and these days, he imagines ways to improve everyday objects through engineering.

Tinkering led Petersen to power engineering. During an independent research project under Assistant Professor Eric Severson, he designed a controller for advanced motor drives—and with Severson's encouragement, subsequently enrolled in three power engineering courses. Peterson was hooked, finding the combination of different fields from which the discipline draws to be utterly enticing.

During two summer internships at semiconductor company Silicon Labs, Petersen further developed his interests in embedded systems, field-programmable gate arrays, firmware, circuit design, printed circuit board layout, simulation and project specification. At Silicon Labs, he worked on firmware that ran deeply embedded systems to enable radio in vehicles and handheld devices, in addition to designing a customer-facing printed circuit board to integrate consumers' radio systems with the company's software.

Constantly designing and making things, Petersen has an extensive backlog of personal electronics projects, as well as his own website to document his efforts. He also keeps busy and in shape as a member of the UW-Madison varsity rowing team, which requires a substantial time commitment for workouts and travel to tournaments across the United States. When he's not on a boat, in the lab or in the gym, Petersen also plays piano for a jazz trio that gives several public performances per year.

Petersen will graduate with his bachelor's degree in computer science in May 2019. He plans to pursue graduate studies in electrical engineering.

NOAH RHODES

Noah Rhodes never shies away from complex problems; in fact, he pursued engineering because he wanted to understand how massive systems such as transportation, logistics or the Internet can function to keep society running smoothly. The massive, yet hidden, complexity of the power system is precisely what attracted Rhodes to power engineering.

Working as a lab assistant in WEMPEC introduced Rhodes to myriad opportunities for optimization as the power system moves toward energy generation from renewable sources. That's an area he wants to further study in his future education and career.

A Greenville, Wisconsin, native, Rhodes got a small taste of that complexity during a summer internship at the National Renewable Energy Laboratory in Golden, Colorado. There, he performed research on optimizing microgrids for commercial buildings, and he presented his results to staff from the U.S. Department of Energy.

Colorado was the perfect place for Rhodes to spend the summer, as he is an avid rock climber and road bicyclist. He's also a martial arts instructor for the UW-Madison Taekwondo Club and practices speaking Norwegian with the Scandinavian Languages Club.

And though Rhodes is conversant in Norwegian, he also recently has tackled the challenge of communicating in Spanish; he is the construction manager for the UW-Madison student chapter of Engineers Without Borders project in Guatemala.

After earning his bachelor's degree in electrical engineering in August 2019, Rhodes intends to remain at UW-Madison for doctoral studies in electrical engineering.

JOSEPH WASSERMAN

Growing up in Mequon, Wisconsin, Joseph Wasserman first became fascinated by the many different fields within engineering, thanks to his high school physics teacher, Paul Sivanich. In particular, Sivanich's lessons about circuits sparked Wasserman's interest in developing technology during his future career.

Wasserman found his way to power engineering during a sophomore-year internship with the Alliant Energy distribution engineering team, where he analyzed contingency plans for the distribution network in the company's northeastern service territory. While working at Alliant, Wasserman contributed to several major distribution projects, which solidified his passion for power systems engineering and working across all operational levels of the grid.

In addition to his internship, Wasserman has been the student assistant for Professor Nick Hitchon's ECE 342 course, *Electronic Circuits II*, since his sophomore year—despite not taking the class himself until summer 2018. Although learning the course material and writing solution keys for feedback amplifier problems has required many long hours, Wasserman has found coaching students in the classroom to be extremely rewarding.

Although his coursework and commitments keep him busy, Wasserman finds time to relax by working out at the university's Camp Randall Sports Center, exploring Madison with his friends, and playing video games.

After graduating with his bachelor's degree in electrical engineering in May 2019, Wasserman will join the system protection group at Alliant Energy. In the future, he hopes to obtain a postgraduate degree in power engineering and he is also considering the prospect of pursuing a master of business administration degree.

ZACHARY SCOTT WESSON

Always interested in science and math during his childhood in Pewaukee, Wisconsin, Zachary Scott Wesson pursued engineering because he knew that he wanted to work on real-world problems.

Power systems attracted Wesson to the power engineering discipline, especially the myriad ways the grid underpins almost every aspect of modern life. Wesson is passionate about transitioning the U.S. power grid to renewable energy sources in the face of the accelerating climate change crisis, and he's eager to address the technical hurdles associated with such a major shift.

Wesson is an active member of the UW-Madison student chapter of Engineers Without Borders, and he's been involved with the organization's project in Guatemala since the beginning of 2016. As the Guatemala project's representative on a corporate fund-raising committee, he helped design, construct and secure financial support for a pedestrian bridge and a drinking water system in Joyabi, Guatemala, a rural municipality in the department of El Quiche. During summer 2017, Wesson traveled to Guatemala to meet with community members and begin implementation for the pedestrian bridge project.

After graduating with his bachelor's degree in electrical engineering in May 2019, Wesson hopes to obtain a position in the electric utility industry, specifically working on substation design or transmission planning. He's worked on transmission planning before, during a summer 2018 internship with the American Transmission Company, where he conducted system model studies.

Outside of school, Wesson enjoys reading novels, playing disc golf, writing fiction, and playing the immersive fantasy role-playing game Dungeons & Dragons.

ADRIA BROOKS

One of Adria Brooks' childhood pastimes was constructing sprawling cityscapes from technicolor Lego blocks. Growing up in Tucson, Arizona, and Nashville, Tennessee, Brooks also was fascinated by astronomy and dreamed of exploring the universe. Those aspirations propelled her into engineering with hopes of working in a space program.

After graduating from the University of Arizona with a bachelor's degree in engineering physics in 2011, Brooks spent several years working at Tucson Electric Power Company, where she tested solar panels in an outdoor yard. During her time with the power company, people frequently asked her why every single roof in sunny Arizona wasn't equipped with solar panels. Brooks quickly learned that limitations in the grid—and not problems with the panels—prevented widespread adoption of solar. That eye-opening experience sparked her interest in power engineering.

Now Brooks' research on electric power systems focuses on market designs and frequency regulating reserves, specifically in the realm of renewable energy. She's exploring marginal price calculations for variable power injections on the grid—for example, from solar and wind sources. It's an unanswered question that could enable stored power from renewables to participate in electricity markets.

Brooks has long been interested in the intersection between engineering and policy, which is why she also is enrolled in UW-Madison's Energy Analysis and Policy Program, which is housed in the Nelson Institute for Environmental Studies. The opportunity to pursue policy concurrently with research was one reason that Brooks came to UW-Madison for her graduate studies.

When she graduates, Brooks is still trying to decide whether to pursue energy policy work in Washington, D.C., or return to the national laboratory system and desert mountains of the western United States. She has a little time, however: She completed her master's degree in electrical engineering in 2018, and expects to finish her PhD by summer 2020.

SKYLER S. HAGEN

As a child in Markesan, Wisconsin, Skyler Hagan was surrounded by farm machinery, and his early tinkering around the barn set him on a path to pursue engineering. After obtaining his bachelor's degree in physics from Ripon College in Ripon, Wisconsin, in 2014, Hagen enrolled at UW-Madison, where he discovered that power engineering was the perfect discipline to bridge his interests in electrical and mechanical topics.

Hagan completed his master's degree in mechanical engineering at UW-Madison in 2016 and elected to remain on campus to pursue his PhD because he enjoys the close-knit atmosphere of the power engineering program. His research is aimed at developing a compact system that can transfer electrical energy wirelessly across a rotating air gap, between a stationary power source and a rotating electrical load.

Outside of the lab, Hagan works as a volunteer firefighter with two departments in southern Green Lake County, Wisconsin. He's also the president of the Badger Amateur Radio Society W9YT, UW-Madison's ham radio club.

After his expected graduation in December 2019, Hagan hopes to pursue product design engineering in electric machines and drives. He has experience in the field, thanks to a 2016 internship with John Deere Construction and Forestry, where he became skilled at using a dynamometer to characterize electric machines and at modeling liquid cooling systems. He's eager to find a position that affords him similar opportunities for hands-on research, too.

His hobbies include repairing and restoring antique electronics as well as ice fishing.

TIMOTHY A. POLOM

Engineering was a natural fit for Timothy Polom, especially because both of his parents, as well as his brother, also have careers in the sciences. Originally from Sterling Heights, Michigan, Polom's mother is in medicine and his father and sibling are engineers.

When Polom was an undergraduate in mechanical engineering at Michigan State University, one of his professors encouraged him to, as he says, "develop into a T-shaped person," meaning somebody who has a wide breadth of skills and depth of knowledge. It's a lesson Polom took to heart, and he took an array of courses on mechatronics and control. Now in his graduate studies, Polom is drilling deep into control systems for power engineering, specifically studying methods for more optimally regulating power with the goal of accelerating a societal transition toward sustainable energy technologies.

A world traveler, Polom studied abroad at RWTH Aachen University in North Rhine-Westphalia, Germany, where he worked in its Institute for Plastics Processing. After completing his bachelor's degree in 2013, he participated in a research experience at IIT Madras in Chennai, India, to study wave actuation, propagation and harmonic analysis for nondestructive evaluation.

Polom has continued to work abroad during his graduate studies at UW-Madison. He developed thermal sensing and control techniques as an intern in the motor drive business unit at Delta Electronics in Taoyuan, Taiwan, and he also recently returned to Germany to advance his graduate research with a stint at the Institute of Power Electronics and Electrical Drives at RWTH Aachen.

Teaching, mentorship and service to society have always been priorities for Polom. On top of roles as a teaching assistant and tutor, Polom has completed three courses with the UW-Madison Delta Program, which provides evidence-based best practices in education for STEM teachers. Additionally, Polom initiated and co-founded the mechanical engineering graduate student association at UW-Madison and served for two semesters as a representative on the College of Engineering graduate student advisory committee.

TIMOTHY S. SLININGER

Timothy Slininger first became interested in engineering after seeing videos of NASA scientists (as he describes), "in white lab coats working on complicated math and machinery to explore the workings of the universe."

Slininger hails from Strasburg, Pennsylvania, and came to UW-Madison for graduate school. Currently, he is pursuing a PhD in mechanical engineering. His advisor Robert Lorenz, who passed away in January 2019, was known for boundless and infectious enthusiasm. And when he met Lorenz during a graduate recruitment weekend on campus, that energy inspired Slininger to enter the power engineering field. Now in his sixth year, Slininger is still working on the project Lorenz described that weekend. It's an effort to harness the power of computer vision to improve electric machine performance.

Before enrolling at UW-Madison, Slininger worked as a software engineer for BAE Systems, where he supported networking and communication systems for the U.S. Navy. He also held a systems engineer position at Advanced Solutions for Tomorrow, where he developed new network systems for the U.S. Navy under the SBIR program. Additionally, he pursued a summer mechanical engineering internship at Oak Ridge National Laboratory.

Slininger earned two master's degrees from UW-Madison—in mechanical engineering and in electrical and computer engineering—in 2017. He also completed another master's degree in computer science at Southern Connecticut State University in 2013. During his undergraduate education at the University of Pittsburgh, Slininger double-majored, receiving bachelor's degrees in computer science and classics in 2006.

Although graduate school leaves scant free time for hobbies, Slininger still enjoys hearkening back to his childhood fascination with NASA by learning about astronomy. He also keeps his secondary major in classics fresh by reading about medieval history as often as possible. An Eagle Scout, he has continued his passion for camping and heads outdoors on the weekends in the summer with his wife. They also love spending time with their two Japanese Chin dogs.

The Grainger Foundation of Lake Forest, Illinois, established in 1949 by Mr. and Mrs. William Wallace Grainger, has provided substantive support over the years to a broad range of organizations, including museums and educational, medical, and human services institutions.

David W. Grainger, Chairman of The Grainger Foundation, received his BS in electrical engineering from the UW-Madison in 1950.