

Daniel Reed

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Education

- 2018 - Present** **Purdue University**, West Lafayette, IN
Ph.D. Mechanical Engineering
- 2014 - 2017** **Rensselaer Polytechnic Institute**, Troy, NY
B.S. Mechanical Engineering
GPA: 3.91/4.00

Awards and Honors

- 2018** Purdue Laura Winkelman Davidson Graduate Fellowship
2018 Purdue Ben M. Hillberry Graduate Scholarship
2017 RPI Founders Award of Excellence
2014 2024 Engineering Bicentennial Award
2014 NYS Award for Academic Excellence

Research Interests

Energy conversion, transport, and storage for applications in renewable energy, thermal transport in nanostructures, multiphase heat transfer

Work Experience

- Spring 2018** **Bioenergy Technologies Intern**, Idaho National Laboratory
Idaho Falls, ID
As an intern at INL, I developed COMSOL simulations to validate analytical models for heating and cooling in biomass materials during Transient Plane Source (TPS) thermal property measurements. In addition, I designed new test equipment to more accurately characterize the shear properties of biomass materials. I also collected experimental data to analyze how bulk biomass materials flow through industrial equipment.
- Summer 2016** **Hardware Development Intern**, IBM
East Fishkill, NY
In this internship, I designed microelectronic test equipment for use in lab/manufacturing support and new product introduction. I produced engineering drawings to prepare parts for manufacturing, and generated 3D printed rapid prototypes when necessary. I developed proficiencies in mechanical design and SolidWorks modeling as a result of this internship, which has helped me design and manufacture experimental equipment for use in research.

Research Experience

- Summer 2017** **Undergraduate Researcher**, Adviser: Dr. Shankar Narayanan, RPI
“Thin-Film Evaporation”
The goal of this project was to test the effects of surface structure and wettability on evaporative heat transfer rate for applications in electronics cooling and water desalination. I fabricated and characterized Al samples with hierarchically

structured surfaces and wettabilities ranging from superhydrophobic to superhydrophilic, and performed experiments to determine that heat transfer rates from the evaporation of water droplets increase exponentially as wettability increases.

Spring 2017

Undergraduate Research, Adviser: Dr. Diana Borca Tasciuc, RPI
“Transport in Phosphor Particle”

The goal of this project was to quantitatively describe the radiative transport of incident solar radiation in a single irregular 3-D phosphor particle within a luminescent solar concentrator. I designed a Monte Carlo simulation that utilized the equations and theory of radiation heat transfer to stochastically determine where light is reflected, transmitted, and emitted in the particle. The results showed that light is scattered anisotropically in a single luminescent phosphor particle.

Presentations

Summer 2017

RPI Summer Undergraduate Research Symposium, Troy, NY
“Effects of Surface Wettability on Evaporation Heat Transfer”

Research Skills

Programming

C++, C, Python, MATLAB

Modeling and Analysis

Siemens NX, SolidWorks, NX Nastran, COMSOL

Manufacturing

MakerBot 3D printers, LulzBot 3D printers, vertical milling machines, lathes

Data Collection

LabVIEW/DAQ, First Ten Angstroms software

Teaching Experience

Summer 2017

Instructor, 3D Printing and Engineering Design Program, Troy, NY

This summer outreach program was designed to educate students in the Troy Boys and Girls Club about 3D printing and for them to apply this knowledge to engaging engineering design challenges in aerodynamics and wind energy. I designed the program curriculum and taught the students using a hands-on approach. Students were taught about the topic of the design challenge, designed a solution in an elementary CAD program, and then 3D printed and tested their designs.

Summer 2017

Video Developer, Engineering Ambassadors REACH Program, Troy, NY

The objective of the REACH program is to bring the content of the Engineering Ambassadors to an even larger audience by converting presentations into an online format. This summer, I recorded the first videos for this program and adapted my 3D Printing and Engineering Design program for online use. These efforts will complement and expand the outreach efforts of the Engineering Ambassadors.

Spring 2015 -

Present

Senior Ambassador, RPI Engineering Ambassadors, Troy, NY

The RPI Engineering Ambassadors travel to local K-12 schools to give exciting, hands-on presentations on topics in engineering to inspire and expose young students to careers in engineering they may not know exist. I go on 2-3 school visits each semester and participate in community service events to work towards accomplishing these objectives. As a result of my work in the program, I have developed strong public speaking and communication skills.