



## **DIRECT: Data Intensive Research Enabling Clean Technologies**

**A graduate training program for UW graduate students interested in data enabled discovery and design of advanced materials for clean energy**



Discovering new materials that will generate and store renewable energy in a low cost, environmentally benign and scalable fashion is perhaps the most important technological challenge facing society today. However, all phases of this scientific process – design, synthesis, and characterization – are routinely stymied by the same challenge: researchers are not equipped to handle the deluge of data coming from their labs and high performance computers. DIRECT, a UW program funded by the National Science Foundation, addresses these challenges by providing training that will equip a new generation of energy researchers to handle the massive data sets arising from all stages of materials discovery.

### **APPLICATION & QUALIFICATIONS**

No previous data science training is required. PhD students should be in the second year of their program. MS students should be in their first year. Interested MS students should contact their graduate program coordinator.

The first cohort of students began the program in Fall 2016. Applications for future cohorts will be accepted online at [www.cei.washington.edu/opportunities/direct](http://www.cei.washington.edu/opportunities/direct).

### **PROGRAM DETAILS**

DIRECT provides UW graduate students the opportunity to receive data science training, practice applying new tools and skills in a project-based learning environment, and gain experience working with industry and academic partners on a team-based capstone project.

As a DIRECT trainee you will:

- Participate in a customized 2 course sequence to gain supplementary training in data sciences and materials design and, if desired, take intensive “crash courses” in scientific computing and iPython.
- Work with a team on a data-intensive research project relevant to your graduate work, receiving regular feedback from project sponsors and training experts.
- Have the chance to participate in an internship or work abroad at partner institutions.
- Participate in data science seminars, events, training, and professional development activities organized by the Clean Energy Institute, the eScience Institute, and the DIRECT program.
- Have the opportunity to apply for two quarters of stipend and tuition support to complete an independent data science project after completion of coursework and team research project.

### **MORE INFORMATION**

For further details about the program, visit [www.cei.washington.edu/opportunities/direct](http://www.cei.washington.edu/opportunities/direct) or contact the PI:

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### ABOUT THE TRAINING PROGRAM

DIRECT is funded by the National Science Foundation Research Traineeship Program (NRT). It is comprised of three phases: 1) new graduate coursework at the nexus of data science and advanced materials for energy, 2) a project-based learning (PBL) that allows trainees to apply new skills and work on challenging real world problems in a team-based setting, and 3) capstone experiences that leverage broad networks spanning industry, national labs and several international partners. The thematic focus of the research is next-generation materials for batteries and photovoltaics. The project based learning component of the traineeship will provide graduate students the chance to teach and practice leadership and management skills, a unique opportunity most trainees would not otherwise receive. DIRECT trainees who complete the program will be credentialed and equipped for many new career options that require data science training and prepared with the skills needed to thrive in the economy of the 21st century.

### TYPICAL SCHEDULE

Quarters	Description
WI 18	DIRECT trainees will work with program staff to plan a customized 2-3 course sequence to ensure each student meets core competencies in the area of data science (e.g., machine learning and data visualization) and materials design.
SP18 – WI19	DIRECT trainees will work in project teams on a real research project/problem related to issues of data management, processing or statistics as applied to design of new materials. Program staff and faculty will customize the project experience to be relevant to trainees PhD or MS theses/projects.
SP19 – SU19	DIRECT trainees will have the option to apply for supplemental “top off” fellowships to support an independent innovative data science project related to their thesis project.

### PARTNERS

Bellevue College  
University of Washington eScience Institute  
Pacific Northwest National Laboratory  
University of Campinas, Brazil  
Zhejiang University, China

### LEARN MORE

To learn more about the program, visit [www.cei.washington.edu/opportunities/direct](http://www.cei.washington.edu/opportunities/direct)

