UC San Diego
JACOBS SCHOOL OF ENGINEERING
NanoEngineering

UCSD NANOENGINEERING/CHEMICAL ENGINEERING

Virtual SEMINAR SERIES

Wednesday, January 20, 2021
Seminar Presentation: 11:00am – 12:00pm PT
Zoom Seminar

"Opportunities and Challenges of Applying ML to Biological Experiments"

Annalisa Pawlosky, PhD
Google

Abstract: Google Accelerated Science (GAS) is an organization focused on producing breakthroughs in the natural sciences, from quantum physics to biological sciences, by applying machine learning (ML) and large scale computational analysis to large-scale physical experimentation. GAS brings together experimentalists and analysts to design scientific studies and build models in novel ways to answer today's most exciting questions. In the process, we encountered significant challenges to classifying patterns in experimental data, and generating predictions with transferable performance in real world applications. Today's talk discusses the mistakes made along the way, lessons learned, and strategies we have implemented to improve ML model predictions or physically manipulate the experimental conditions to yield ML-compatible data sets.

Biosketch: Annalisa founded and built a biochemistry and molecular biology experimental laboratory at Google in 2016 with a primary focus of integrating machine learning algorithms with custom experimental techniques to solve biology's most challenging questions. During the past 4.5 years, Annalisa managed and led over 50 experimentalists and computational scientists in laboratory technician, postdoctoral and research scientist roles over a variety of projects that led to multiple patent applications, several invited talks at international conferences and two publications currently under review. As Principal Investigator of the Google Accelerated Science Wet Laboratory, Annalisa invented a novel approach to protein sequencing by direct conversion of amino acid sequences into DNA barcodes on a high throughput Next Generation Sequencer. Google is currently selling the patents related to this work to an Alphabet-external company.

Prior to working at Google, Annalisa Pawlosky earned her PhD under Alexander van Oudenaarden through the Harvard-MIT Division of Health Sciences and Technology by developing cutting edge techniques for single molecule RNA detection in single mammalian cells. Before her PhD, Annalisa earned a BS in Physics from Virginia Tech with a minor in mathematics graduating magna cum laude. She conducted her postdoc at Stanford University as a Stanford University Molecular Imaging Fellow under Michael Clarke designing custom real-time, live-imaging, single molecule protein interaction probes.

Educational Development: As someone who planned and solely focused on an academic career up until her second year of her postdoc at Stanford, Annalisa was surprised to find herself building and running a research laboratory for industry. This opportunity opened her eyes to what existed, what you can create and some of her incorrect assumptions about research in industry. Annalisa will include a brief discussion about her journey, what surprised her, lessons learned and how to navigate a research position in industry.

Register to receive a zoom link the day of the seminar:
https://docs.google.com/forms/d/1hzxcTXN3Ng4d-6hHtPN-J6n7W_Oxb3UG2Z9XCM8Wto4