

Artificial Intelligence for Synthetic Biology Schedule

AAAI Fall Symposium

October 18-20, 2018

Westin Arlington Gateway, Arlington, VA

Symposium website: <https://www.synbiotools.com/ai-for-synbio-fss-2018/>

Synthetic Biology Terms and Definitions: <http://goo.gl/mS5J2q>

AI Terms and Definitions: <http://goo.gl/wcXjjk>

Welcome! Our primary goal for this symposium is to begin to connect and build mutually beneficial collaborations between the AI and the synthetic biology communities. There are many problems and applications at the intersection of these two fields. We hope this is but one in a series of meetings to bring these two communities together.

Organizing Committee:

Aaron Adler (BBN Technologies), Mohammed Ali Eslami (Netrias, LLC),
Jesse Tordoff (MIT), and Fusun Yaman (BBN Technologies)

Thursday

9:00am - 9:15am	Symposium Introduction	
9:15am - 10:30am	Introduction to Synthetic Biology	Eric Young (WPI)
10:30am - 11:00am	Coffee Break	
11:00am - 12:30pm	Talk: Cell-free synthetic biology as a source for deep learning	Zachary Sun
	Talk: Using Synthetic Biology for bio-inspired computing?	Martín Gutiérrez, Javier Carrión and Yerko Ortiz
	Talk: Formalizing Sample Transformation Plans	Daniel Bryce, Robert Goldman, Ugur Kuter, Alex Plotnick, Matt DeHaven, Chris Geib, Jake Beal, Nic Roehner and Bryan Bartley
	Talk: Enabling AI-Assisted Drug Screening and Synthetic Biology Engineering: Multi-Parametric Data-Driven Cell Profiling by CMOS Multi-Modal Cellular Interfacing Arrays	Adam Wang, Jongseok Park, Doohwan Jung, Gregory Junek and Hua Wang
12:30pm - 2:00pm	Lunch	
2:00pm - 3:00pm	Introduction to Artificial Intelligence	Hector Munoz-Avila (Lehigh University)
3:00pm - 3:30pm	Talk: Making AI Work for Synthetic Biology: Challenges and Opportunities	Rajmonda Caceres and Timothy Dasey
3:30pm - 4:00pm	Coffee Break	
4:00pm - 5:30pm	Discussion Session: What are the big/hard problems in Synthetic Biology?	
6:00pm - 7:00pm	Reception	
7:00pm - ?	Group outing (optional)	

Friday

9:00am - 10:00am	Keynote	Ron Weiss (MIT)
10:00am - 10:30am	Talk: Mixing metadata without mixing metaphors: Integration of Expert and Deep Learning for Detection of Engineered DNA	Misha Wolfson, Sandrine Boissel, Nancy Zhang, Michael Napolitano, Lucas Hartsough, Patrick Boyle, and Joshua Dunn
10:30am - 11:00am	Coffee Break	
11:00am - 11:30am	Talk: A Framework to Determine Number of Biological Replicates for Unsupervised Learning	Mohammed Eslami, Sahil Loomba, Diogo Camacho, James Collins and Narendra Maheshri
11:30am - 12:30pm	Brainstorming AI Solutions; AI lightning talks	
12:30pm - 2:00pm	Lunch	
2:00pm - 3:30pm	Government Funded Research in AI + SynBio	Jennifer Roberts (DARPA I2O); Matthew Hepburn (DARPA BTO); Mathew Lux (Edgewood Chemical Biological Center - Army); Mitra Basu (NSF); David Rampulla (NIH)
3:30pm - 4:00pm	Coffee Break	
4:00pm - 5:30pm	Talk: An Automated Scientist for Designing and Optimizing Microbial Strains for Production of Small Molecules	Amoolya Singh, Benjamin Kaufmann-Malaga and Joshua Lerman
	Talk: The Transcriptic cloud lab enables closed-loop biological optimization	Yang Choo, Donald Dalton and Peter L. Lee
	Talk: Learning Composition Rules for Mammalian Circuits with Neural Attention	Jenhan Tao, Gregory Fonseca, Christopher Benner and Christopher Glass
	Talk: Predictive Engineering in Synthetic Biology via Active Learning	Peter Tonner, Swarnavo Sarkar, A. Gilad Kusne, Daniel Samarov and David Ross
6:00pm - 7:30pm	Plenary Session	

Saturday

9:00am - 9:50am	Synthetic Biology and AI ethics	
9:50am - 10:30am	Talk: Synthetic Gene Network Parameter Identification in Coupled Differential Systems via Finite Element Discretization and Neural Network Analysis	Harley Edwards and Peng Xu
	Talk: A Tool To Create Models of BioChemical Cascades	Chun Wai Liew and Robert Kurt
10:30am - 11:00am	Coffee Break	
11:00am - 12:30pm	Brainstorming/Breakout session; Next steps discussion	