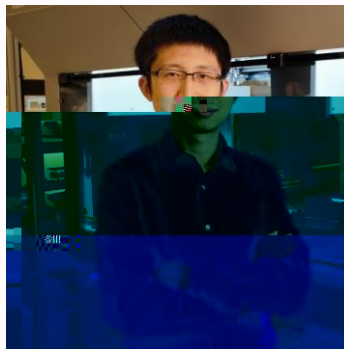




Enabling Algorithm-driven Synthetic Biology Research with Fully Automated Biofoundries



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Dr. Ran Chao earned his Ph.D degree from department of Chemical & Biomolecular Engineering in the University of Illinois. He attended ZJU and later transferred to the University of British Columbia in Canada. Dr. Chao is a co-founder and CEO of LifeFoundry Inc., an emerging startup in the high-throughput synthetic biology space. Ran designed and built iBioFAB (Illinois BioFoundry for Advanced Biomanufacturing), the first prototype of a fully automated and highly versatile robotic system for molecular and cellular engineering. With this technology, he co-founded LifeFoundry Inc., a company aiming to accelerate R&D in biotechnology with synthetic biology, robotics, and machine learning. LifeFoundry now has a team of 17 people and are taking contracts from Fortune 500 companies.

ABSTRACT:

Synthetic biology applies engineering principle to study biological systems through design-build-test cycles and has great promises in health, biochemical industry, as well as fundamental discovery. However, the workflows are still mainly driven by human research scientists. As a result, it's slow, expensive, and prone to human errors and biases. In 2015, we developed the first prototype of a fully automated and highly versatile biofoundry at the University of Illinois. Recently, LifeFoundry team has developed the 2nd generation biofoundry, D.A.R.W.In. system (Directed Autonomous BioResearch Workspace Infrastructure). These platforms allow algorithms to directly design biosystems, orchestrate workflows, and analyze data. This talk will discuss the latest applications of algorithm-driven synthetic biology at the University of Illinois as well as LifeFoundry, Inc. including pathway fine-tuning, genome-scale perturbation, and mammalian genome editing.

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