Dustin Sands

Cambridge, MA 02139 USA
https://portfolio.DustinSands.com
Dustin.Sands@gmail.com or +1 408 462 2709
www.linkedin.com/in/Dustin-Sands

EDUCATION

University College London (London, UK) 2012-2016
Masters of Engineering, Chemical with Biochemical Engineering (with Honours)
American citizen studying abroad

EXPERIENCE

Ark Biotech (Cambridge, MA) July 2022 - September 2023
Senior Process Modeler

- Created simulation framework including and integrating bioreactor and cellular models. Framework supports creation of models, analysis of data, and running of Digital Twins in easily modular form
- Analyzed, modeled, and reported on manufacturing client data that yielded significant yield increases on cultured meat bioprocesses
- Simulated and compared various bioreactor modes and processes in support of technology selection and technoeconomic analyses (e.g, fed-batch vs perfusion)

Takeda (Cambridge, MA) December 2020-July 2022
Machine Learning and Manufacturing Data Automation Research Investigator [Cell Therapy Oncology]

- Technical lead on entire-process simulation tool that models operational timings and quality attributes with applications in process optimization, supply chain forecasting, and operational scheduling
- Core team member of In-Silico CMC and contributor to global In-Silico CMC Playbook
- PM for upstream predictive control project utilizing a digital twin and hybrid modeling
- Skills Developed: Python, Machine Learning, Project Management, Simio, Hybrid Modeling

Researcher (Sunnyvale, CA) March 2020-December 2020

- Studied and developed machine learning methods and how they can be applied to bioprocess development
- Created an Upstream Cell Culture Simulator; https://portfolio.dustinsands.com/cc-sim
- For current projects, see https://workshop.dustinsands.com
- Skills Developed: System-Level simulations, cyber-physical systems, machine learning (supervised and reinforcement), python, macroscopic modeling, git

Boehringer Ingelheim (Fremont, CA) January 2019-March 2020
Scientist I [Bioprocess Engineering and Cell Culture]

- Characterized and assessed new technologies for a next-gen biomanufacturing platform
- Lead, designed, analyzed, and presented experiments with primarily lab scale reusable bioreactors for perfusion processes. Experiments included scaledown / scaleup, process characterization studies, offline models, and designing novel perfusion bioreactor systems
- Developed process analytical technology for multiparameter control
- Skills / Equipment: Bioreactors (SUBs and reusable) at 2L to 1000L scales, cGMP, cGDP, aseptic technique, shake flasks, Python, Tensorflow, Keras, Visual Basic, SIMCA, TruBio / DeltaV

RELEVANT SKILLS

Lab Techniques and Hardware Experience Proficiency with current lab hardware such as the Tecan Freedom Evo, reusable and single-use bioreactors (lab and pilot plant scale), perfusion (ATF and TFF) and wave reactors, shake flasks, aseptic technique, centrifuges, micro-, ultra-, and nano-filtration, USD devices, spectroscopy (UV-vis, fluoresent), particle sizing, and other common assays.

Python Creations include a Cell Culture Simulator and a Hanabi agent trained through Reinforcement Learning. Keras, Tensorflow, numpy, static typing, and many other common packages

Other Knowledge C/C++, Supervised, Unsupervised, and Reinforcement Machine Learning, MATLAB, GAMS, LaTeX, HTML, Word, PHP, SIMCA, Simio
With a focus on cryptopgraphy, the blockchain, and state-based probability.