Sebastian **Bernasek**

Data Scientist | Chemical Engineer

San Francisco Bay Area

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Skills

Data Engineering
Relational databases
Web scraping
Structured text & NLP
Feature selection
Dimensionality reduction

Analysis
Hypothesis testing
Bayesian inference
Unsupervised learning
Networks & Time series
Visualization

Computer Vision
Feature extraction
Image segmentation
Feature classification
Spatial analysis
Quantitative microscopy

Modeling
Stochastic processes
Dynamical systems
Nonlinear regression
Classification
Agent-based models

Coding
Python & Cython
Package development
REST APIs
Git, LaTeX, HTML/CSS
Unix shell, OSX/Ubuntu

Education

Ph.D. in Chemical and Biological Engineering • 4.0 *Northwestern University* 2014 - 2019

- Advised by Luis Amaral, Neda Bagheri, and Rich Carthew.
- Center Scholar, NSF-Simons Center for Quantitative Biology
- Dissertation combined data science and chemical engineering to explore how cells make reliable decisions.

B.S. in Chemical Engineering • 3.8 • High Honors *University of California, Santa Barbara* 2008 - 2012

- Exchange student at Imperial College London throughout 2010/2011.

Experience

Personal Development & Consulting Present

Took a year off to explore the world, while assisting some friends along the way:

- Built a database of 5k+ targeted B2B sales leads using a combination of web-scraping, commercial APIs, and machine learning.
- Demystified a sales pipeline by using unstructured text profiles to predict client outcomes.
- Automated text content extraction and parsing routines that will annually save hundreds of hours of tedious labor.

Researcher at Northwestern University *Evanston, IL* 2014 - 2019

- Published in high profile journals including Cell and PLOS Computational Biology.
- Designed, built, and deployed several simulation and analysis frameworks for the broader research community.
- Discovered a surprising link between expression dynamics and metabolism by developing a model that accurately predicts developmental mistakes.
- Discovered a novel cell decision mechanism by using computer vision and statistical analysis to derive insight from microscopy data.
- Increased data volume and quality by developing a computer vision pipeline for automated analysis of microscope images.

Day to day life entailed:

- Exploratory analysis and visualization of image and time series data.
- Developing creative strategies to tease insight out of noisy experiments.
- Building mathematical models to generate testable predictions.
- Conducting tens of thousands of parallel simulations on a distributed computing cluster.
- Frequent collaboration with wet labs to design more impactful experiments.
- Brainstorming & hackathons for data-driven projects of all flavors, from painting styles to political tweets.
- Communicating complex ideas to diverse audiences.
- Academic reading, writing, peer review, and grant proposals.
- Co-teaching undergraduate chemical engineering courses and data science bootcamps.
- Mentoring graduate, undergraduate, and high school students in formulating their own research.

Process Engineer at LanzaTech *Chicago, IL* 2012 - 2014

- Invented three processes for converting waste gases to lipid products. One patent granted, two more applications pending.
- Designed and built the company's core process modeling framework.
- Identified promising technology partners, ultimately leading to major investments.
- Modeled refinery-scale processes to predict and optimize economic and life-cycle performance.
- Advised executives and investors with technical analysis.

Research Assistant at UC Santa Barbara *Santa Barbara, CA* 2011 - 2012

- Conducted first ever dynamic measurement of interaction forces between vesicles. Published in *Soft Matter*

Summer Intern at UL Air Quality Sciences *Atlanta, GA* Summer 2011

Projects, software, publications, patents, mentorship history, and teaching history are listed on my website. References available upon request.