Sebastian **Bernasek**

Data Scientist | Complex Systems Researcher

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Overview

Data scientist with several academic publications and issued patents. Brings creativity, scientific literacy, and engineering pragmatism, all backed by python scripting skills and a healthy dose of common sense. Recently completed PhD after 3 years at a cleantech startup, now seeking to continue learning while contributing to something fun and impactful.

Expertise includes:

- **Developing mathematical models** to analyze and simulate complex processes.
- **Empowering decisions with quantitative insight** backed by rigorous analysis.
- **Building rich data sets** by turning qualitative observations into quantitative measurements.
- **Hacking together data-driven solutions** to a wide variety of everyday problems.
- **Prototyping state of the art methods** from the research literature.
- **Collaborating with multidisciplinary teams** to coordinate R&D efforts.
- **Bridging the gap between research, engineering, and business** by focusing on the bigger picture.

Skills

Scientific Computing python / cython / numpy, scipy, pandas, etc. / jupyter / git / unix shell / latex / HTML & CSS
Data Engineering feature selection / dimensionality reduction / image processing / structured text / NLP / web scraping
Analysis hypothesis testing / unsupervised learning / time series analysis / pattern detection / visualization (matplotlib, seaborn, graphviz, etc.)
Modeling dynamical systems / stochastic processes / nonlinear processes / process simulation / LTI systems & control theory
Machine Learning classical methods (scikit-learn, statsmodels, etc.) / basic familiarity with deep learning architectures & pytorch (eager to practice)
Research project conception / experimental design / scientific literacy / technical communication / inter-disciplinary collaboration

Education

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

- Dissertation combined data science and chemical engineering to explore how cells make reliable decisions.

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

Experience

Data Science Consulting (while traveling!) Present

- Built a database of 5k+ targeted B2B sales leads using a combination of web-scraping, commercial APIs, and machine learning.
- Boosted a recruiting firm's bottom line by leveraging data-driven insight to focus resources on more probable hires.
- Saved hundreds of hours of tedious labor by automating several PDF content extraction and parsing routines.

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

- Published in high profile journals including *Cell* and *PLOS Computational Biology*.
- Discovered a surprising link between gene expression and metabolism by predicting the emergence of developmental mistakes.
- Discovered a novel cell decision mechanism by using computer vision to derive quantitative insight from microscopy data.
- Achieved >100x speedup of a common technique by developing an algorithm to annotate patch patterns in microscopy data.
- Designed, built, and deployed several python frameworks to help the research community analyze and simulate various biological processes.
- Mentored (and learned from) two inspiring young researchers in formulating their own research.

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

- Invented two patented processes for converting waste CO2 to valuable lipid products.
- Designed and built the company's core process modeling framework, which was rapidly adopted by all engineers.
- Collaborated with technology providers to identify complementary value streams, leading to corporate partnerships.
- Modeled refinery-scale processes to predict and optimize economic and life-cycle performance.
- Advised executives and investors with technical analysis that directly inspired major strategic decisions.

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*

Additional experience, projects, software, publications, patents, mentorship history, and teaching history are listed at www.sbernasek.com