Sebastian **Bernasek**
Data Scientist | San Francisco Bay Area

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Overview

Data scientist with software and research publications in top academic journals, issued patents, and startup experience. Brings a unique blend of creativity, math and science literacy, and engineering pragmatism, all backed by strong python skills and a healthy dose of common sense.

Expertise includes:
- **Building models** to analyze and simulate complex processes.
- **Developing analysis and simulation pipelines** to support R&D efforts.
- **Prototyping state of the art methods** from the research literature.
- **Hacking together creative solutions** to a broad variety of problems.
- **Bridging the gap between research, engineering, and business** through effective communication.

Python projects:
- **sbernasek.com/flyqma** - automated analysis of patch patterns in microscope images of the fly eye
- **sbernasek.com/flyeye** - systematic measurement, analysis, and modeling of cell behavior in microscope images of the fly eye
- **sbernasek.com/tfbinding** - simulation of cooperative binding events between proteins and DNA (cython)
- **sbernasek.com/genessa** - exact stochastic simulation of large-scale chemical reaction networks (cython)

Skills

Python package development / pandas, numpy, scipy, scikit-learn, statsmodels, etc. / matplotlib / cython / PIL & open-cv
Engineering MySQL / Rest APIs / web scraping / jupyter / git / unix shell / latex / HTML & CSS
Data Mining statistical analysis / dimensionality reduction / clustering / image & text processing and analysis / visualization
Modeling stochastic processes / spatio-temporal dynamics / process simulation / toy model development
Machine Learning practical experience with classification & regression methods / basic familiarity with deep learning & pytorch (eager to learn!)
Research algorithm & pipeline development / hypothesis testing / scientific publication / inter-disciplinary collaboration / software development

Education

Ph.D. in Chemical and Biological Engineering   *Northwestern University*   2014 - 2019
- Dissertation combined data science and chemical engineering to explore how cells make decisions during development.
- Published in high profile academic journals including Cell and PLOS Computational Biology.

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

Experience

Data Science Consulting (part-time while traveling!)   Present
- Built a predictive model that helped a recruiting firm focus their ad spend on more probable hires.
- Automated PDF text+image analysis routines to save hundreds of hours of tedious labor.

Researcher at Northwestern University   *Evanston, IL*   2014 - 2019
- Accelerated a popular experimental technique by developing a computer vision algorithm to annotate patch patterns in biological images.
- Discovered a cell decision mechanism by using computer vision and data mining to derive statistical insight from fluorescence microscopy data.
- Developed a statistical mechanical model of transcription factor DNA binding and used it to show how the identified mechanism works.
- Discovered a surprising link between development and metabolism by modeling the emergence of developmental mistakes.
- Designed and built several open-source python frameworks to help the research community analyze and simulate various biological processes.
- Mentored junior students in formulating their own research. Helped teach university-wide programming & data science bootcamp.

Process Engineer at LanzaTech   *Chicago, IL*   2012 - 2014
- Invented two patented processes for converting waste CO_2 to valuable lipid products.
- Designed and built the company's core techno-economic process modeling framework.
- Worked closely with researchers and engineers around the world to circumvent bottlenecks in process scale-up.
- Collaborated with technology providers to identify complementary value streams, leading to corporate partnerships.
- Advised executives and investors with technical analysis that directly inspired major strategic decisions.