David W. Sroczynski, Ph.D.

david.w.sroczynski@gmail.com | 201-739-0978

linkedin.com/in/david-sroczynski-8157664b/ | davidsroczynski.com

Professional Profile Statement

An academic knowledge-base that embraces both chemical engineering and applied math coupled with professional consulting experiences collectively reflects 10+ years of professional success in strategic data analysis. Proven success in enhancing operational efficiency, mitigating infrastructure risks, and data-driven decision-making. Consulting assignments have primarily focused on industrial plant operation, especially analysis of anomalous or extreme data. Expertise consists of coding using various languages to implement and innovate data analysis and model reduction algorithms. Research experience includes data mining and predictive analytics in a variety of systems. Looking to apply my diverse skill set in machine learning to a new role at the forefront of data analytics.

Education

Princeton University, Ph.D., Chemical and Biological Engineering, September 2022

Cornell University, B.S., Chemical Engineering, May 2014

Technical Skills

- Programming: MATLAB, Python, C++, Fortran, shell scripting
- Manifold learning and dimensionality reduction, especially diffusion maps, PCA, and neural networks
- Monte Carlo simulation and GROMACS for molecular dynamics

Experience – Professional

Consultant at Oceanit, May 2020 – April 2023

- Under a Department of Homeland Security grant, developed algorithmic tools to detect malicious data spoofing in multi-sensor scenarios, enhancing infrastructure cybersecurity
- Conducted high-fidelity simulation and data integrity assessments in power plant operations using AVEVA Process Simulation, reducing operational risk.
- Innovated manifold learning algorithms, enhancing the efficiency and precision of data analysis to improve understanding and prediction of complex dynamical systems.

Consultant at ExxonMobil, March 2020 – November 2020

- Applied machine learning techniques to causal inference problems in industrial plant operations, i.e., uncovering the root cause of undesirable plant-wide oscillations.
- Integrated data from different collection modalities using the Mahalanobis metric in manifold learning as well as analogous procedures for neural nets, yielding improved anomaly detection.

Experience – Research

Postdoctoral Fellow at Johns Hopkins University, September 2022 – December 2023

- Applied diffusion maps to facilitate parameter identification and system modeling in embryonic development imaging as well as nonlinear dynamical systems (D.W. Sroczynski et al., 2025, *PNAS Nexus*).
- Applied alternating diffusion maps to multi-sensor scenarios in chemical engineering, including learning the evolution of one sensor based on measurements of a different sensor (D.W. Sroczynski et al., 2024, *PNAS Nexus*).

Ph.D. at Princeton University, May 2015 – September 2022

- Used the structure of data from different viewpoints (e.g., parameters, variables, time) to iteratively infer a more informed data comparison, then applied algorithms to learn the evolution of reduced ODEs and PDEs **(**D.W. Sroczynski et al., 2018, *IJC***).**
- Developed tools for efficient discovery of transition pathways in molecular simulation by biasing along data-driven, iteratively-discovered coarse variables.

Experience – Teaching

Assistant in Instruction — Princeton University

An Introduction to Engineering — Spring 2017

- Basics of chemical engineering analysis, with experiments covering solar panels, biodiesel, and fuel cells

Mathematics in Engineering I — Spring 2016

- Differential equations with engineering applications

Undergraduate Teaching Assistant — Cornell University

- Introduction to Chemical Engineering — Fall 2013
- Fundamentals of Physics (Fall 2011 and 2012) and Heat/Electromagnetism (Spring 2012 and 2013)

Academic Excellence Workshop Facilitator — Cornell University

- Introduction to Java (Fall 2011, Spring 2012), General Chemistry (Fall 2012), MATLAB (Spring 2013), and Multivariate Calculus (Fall 2013)

Selected Awards and Activites

- Gordon Y. S. Wu Fellowship in Engineering, Princeton University, 2014
- Tau Beta Pi Engineering Honor Society, Cornell University, 2013-2014
- Leadershape Institute at Cornell, 2012
- Eagle Scout, Boy Scouts of America, 2009