Elvis Eugene

Groton, CT | 574-250-0570 | elvis.eugene@pfizer.com | linkedin.com/in/elviseugene |

Hightlights

- Computational scientist with an expertise in languagues, both machine understandable and the spoken word: BASIC, Java, C, C++, C#, Python, R, git, Github, Jupyter, Google Collaboratory, and mathematics and probability.

- Eclectic experience in industry and acdemic research.

- I'm looking forward to running a team of my own.

Education

University of Notre Dame
Notre Dame, IN

Ph.D., Chemical Engineering, *Minor:* Computational Science and Engineering — April 2022
M.S., Chemical Engineering — May 2020
Dissertation: Foundations of molecular-to-systems design: Frameworks for data-driven process systems engineering

Ramaiah Institute of Technology
Karnataka, India

B. E., Chemical Engineering — May 2012
Graduated 2nd in a class of 75

Research experience

Senior Scientist, Computational Process Design and Optimization
July. 2022 – Present

Pfizer Worldwide Research, Development, and Medicine — Groton, CT

- Developing dynamic models using first-principles and sparse machine learning for active pharmaceutical ingredient synthesis across the laboratory to manufacturing scales.
- Investigating artificial intelligence for automated and self-optimizing experimentation.
- Augmenting decision-making for economic resource management using optimal experiment design.
- Key research tools include Bayesian optimization, gray-box hybrid modeling, machine learning, probabilistic programming, nonlinear programming, and model-based design of experiments.

Graduate Research Assistant
Aug. 2017 – April 2022

Dowling Lab, University of Notre Dame — Notre Dame, IN

- Created a framework for data-driven decision-making under model-form uncertainty based on gray-box Bayesian hybrid models (BHM).
- Demonstrated that novel polymer membranes are promising for the sustainable recovery of lithium using predictive mathematical models for structure property relationships, superstructure optimization for system design, and nonlinear parameter estimation to define transport phenomena.
- Proposed integrated vision of data science to revolutionize molecular-to-systems engineering.
- Mentored 3 graduate students and 1 undergraduate researcher resulting in 4 journal articles and 2 successful fellowship grants.

Professional Experience

Senior Process Engineer
Sep. 2012 – May 2017

Simon India Limited — New Delhi, India

- Designed (detailed engineering), supervised construction, and commissioned a 2000 metric ton per day sulphuric acid plant with heat recovery system, the first of its kind, at Paradeep Phosphates Ltd., Odisha, India.
- Increased project revenue by 17% by compiling technical documentation for change-order negotiations.
- Negotiated technical issues with client and licensor and served as the junior technical liaison for the caprolactam distillation project at Gujarat State Fertilizer Corporation, Gujarat, India.
- Demonstrated technical mastery and attention to detail as a part of several teams responsible for hazard and operability (HAZOP) studies of the plant as well as factory and site acceptance tests of critical plant subsystems.

Teaching Experience

Teaching Assistant   Aug. 2017 – May 2019
Dept. of Chemical and Biomolecular Engineering, University of Notre Dame   Notre Dame, IN

- Nurtured the academic curiosity of the students while firmly rooting fundamental principles by running tutorial sessions and office hours to elucidate concepts from lectures.
- Developed tutorials to train undergraduate students in the use of software and programming languages.
- Courses: Numerical and Statistical Analysis (Spring 2018, Spring 2019), Thermodynamics II (Fall 2018), Senior Chemical Engineering Laboratory (Fall 2017).

Peer Reviewed Publications

Elvis A. Eugene, Kyla Jones, Xian Gao, Jialu Wang, and Alexander W. Dowling. Learning and Optimization Under Epistemic Uncertainty with Bayesian Hybrid Models. *Computers & Chemical Engineering*, **179**, 108430 (2023). https://doi.org/10.1016/j.compchemeng.2023.108430.

Jialu Wang, **Elvis A. Eugene**, and Alexander W. Dowling. Scalable Stochastic Programming with Bayesian Hybrid Models. *Computer Aided Chemical Engineering*, **49**, 1309-1314 (2022). 10.1016/B978-0-323-85159-6.50218-9.

Noah P. Wamble[†], **Elvis A. Eugene**[†], William A. Phillip, and Alexander W. Dowling. Optimal Diafiltration Membrane Cascades Enable Green Recycling of Spent Lithium-Ion Batteries. *ACS Sustainable Chemistry & Engineering*, **10**, 37, 12207-12225 (2022). 10.1021/acssuschemeng.2c02862. [†]Authors contributed equally.

Joanthan Ouiment, Xinhong Liu, David J. Brown, **Elvis A. Eugene**, Tylar Popps, Zachary W. Muetzel, Alexander W. Dowling, and William A. Phillip. DATA: Diafiltration Apparatus for high-Throughput Analysis. *Journal of Membrane Science*, **641**, 119743 (2022). 10.1016/j.memsci.2021.119743.

Elvis A. Eugene, William A. Phillip, and Alexander W. Dowling. Material Property Targets to Enable Adsorptive Water Treatment and Resource Recovery Systems. *ACS ES&T Engineering*, **1**, 1171-1182 (2021). 10.1021/acsestengg.0c00046.

Elvis A. Eugene, Xian Gao, and Alexander W. Dowling. Learning and Optimization with Bayesian Hybrid Models. *Proceedings of the American Controls Conference*, 3997-4002 (2020). 10.23919/ACC45564.2020.9148007.

Elvis A. Eugene, William A. Philip, and Alexander W. Dowling. Data Science-Enabled Molecular-to-Systems Engineering for Sustainable Water Treatment. *Current Opinion in Chemical Engineering*, **26**, 122-130 (2019). 10.1016/j.coche.2019.10.002.

Elvis A. Eugene, William A. Philip, and Alexander W. Dowling. Material Property Goals to Enable Continuous Diafiltration Membrane Cascades for Lithium-ion Battery Recycling. *Computer Aided Chemical Engineering*, **47**, 469-474 (2019). 10.1016/B978-0-12-818597-1.50075-8.

Selected Honors & Awards

Finalist, American Institute of Chemical Engineers (AIChE) Computing and Systems Technology Division (CAST) Directors' Student Presentation Awards	2021
Best Poster Award, Notre Dame Chemical and Biomolecular Engineering Graduate Student Organization (CBEGSO) Research Symposium	2021
Notre Dame Chemical and Biomolecular Engineering Exemplary Candidacy Award	2020
Notre Dame Learning Outstanding Graduate Student Teacher Award	2020
American Control Conference Travel Award	2020
The Patrick and Jana Eiler's Graduate Student Fellowship for Energy Related Research	2020

Leadership & outreach

Tutor, Robinson Community Learning Center	2021
Session Chair, Decision-making for Industrial Process Systems, AIChE Spring Meeting	2020
Chair, Academic Affairs Committee, Notre Dame Graduate Student Government	2019
President, Research Symposium Committe, CBEGSO	2018
Secretary, Research Symposium Committe, CBEGSO	2017