

Dominic V. Poerio, Ph.D.

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Key Skills and Professional Interests

- Software development and solution architecture, especially focused on data science, machine learning, data engineering, and data architecture
- Strong proponent of DevOps, CI/CD, software engineering best practices, and test driven development
- Driving end-to-end implementation of software projects (infrastructure, database management, algorithms, API design, etc.) from research through production phases
- Experience deploying production quality applications on various platforms
- Programming languages and tools: Python, SQL, POSIX shell, C++, Docker, Spark, TensorFlow, Flask
- Mentorship and training

Professional and Academic Experience

Thermo Fisher Scientific, Remote

Senior Software Architect

March 2023 - Present

Senior Data Scientist

August 2021 - March 2023

- Designed and implemented architectural solutions, microservices, APIs, and batch jobs for various internal and customer facing software applications to meet business requirements
- Created data pipelines and big data extract-transform-load jobs to supply consumable data for application databases
- Developed machine learning applications, including real-time anomaly detection methods for IoT devices and natural language processing methods to classify equipment failure type
- Mentorship/training – Served as mentor for the internal training course on software architecture, solution architecture, and enterprise architecture

Axalta Coating Systems, Philadelphia, PA/Remote

Senior Data Scientist

June 2021 – August 2021

Data Scientist

March 2018 – June 2021

- Developed novel computer vision based methods for quantification of coating composition, automated color matching and formula generation, and computer-aided color matching
- Deployed data-driven models used in internal systems and customer products and collected/mined data from internal databases to design new modeling applications
- Served as technical lead and/or consulted for computational and statistical aspects of global R&D projects, providing software development and maintenance through production
- Mentorship/training – Developed and taught internal course on design of experiments and statistical methods

University of Delaware, Laboratory for Chemometrics, Newark, DE

Graduate Research Assistant, Dr. Steven Brown Research Group

August 2015 – March 2018

- Performed research in chemometrics, multivariate statistical analysis, data science, and machine learning for modeling of data from scientific instruments (on NSF Grant 1506853)

- Devised new methods combining signal processing and predictive modeling for real-time prediction of product quality from chemical manufacturing processes
- Designed algorithms to detect drift and automatically update predictive models used to monitor chemical manufacturing processes

Patent Applications

- Dominic V. Poerio, Neil R. Murphy. Methods and Systems for Determining a Radar Compatible Coating. December 22, 2022. US20220404202. Granted.
- Larry E. Steenhoek, Dominic V. Poerio, Systems and Methods for Matching Color and Appearance of Target Coatings. July 1, 2021. US20210201513.
- Larry E. Steenhoek, Dominic V. Poerio, Systems and Methods for Matching Color and Appearance of Target Coatings. July 1, 2021. US20210201535. Granted.
- Larry E. Steenhoek, Dominic V. Poerio, Systems and Methods for Matching Color and Appearance of Target Coatings. July 1, 2021. US20210201494.
- Larry E. Steenhoek, Dominic V. Poerio. Systems and Methods for Approximating a 5-Angle Color Difference Model. March 25, 2021. US11694364B2. Granted.
- Larry E. Steenhoek, Robert V. Canning, Dominic V. Poerio, Neil R. Murphy. Matching color and appearance of target coatings based on image entropy. June 13, 2019. US11692878B2. Granted.
- Larry E. Steenhoek, Robert V. Canning, Dominic V. Poerio, Neil R. Murphy. M Systems and methods for matching color and appearance of target coatings. June 13, 2019. US20210239531A1. Granted.
- Larry E. Steenhoek, Robert V. Canning, Dominic V. Poerio, Neil R. Murphy. Color Matching Sample Databases and Systems and Methods for the Same. June 13, 2019. US20200387742.

Publications

- Dominic V. Poerio, Steven D. Brown. "Localized and Adaptive Soft Sensor Based on an Extreme Learning Machine with Automated Self-Correction Strategies." *J. Chemom.* **2018**, e3088. (<https://doi.org/10.1002/cem.3088>)
- Dominic V. Poerio, Steven D. Brown. "Highly-Overlapped Recursive Partial Least Squares Soft Sensor with State Partitioning via Local Variable Selection." *Chemom. Intell. Lab. Syst.* **2018**, 175, 104 - 115. (<https://doi.org/10.1016/j.chemolab.2018.02.006>)
- Dominic V. Poerio, Steven D. Brown. "A Frequency-Localized Recursive Partial Least Squares Ensemble for Soft Sensing." *J. Chemom.* **2018**, 32, e2999. (<https://doi.org/10.1002/cem.2999>)
- Dominic V. Poerio, Steven D. Brown. "Dual-Domain Calibration Transfer Using Orthogonal Projection." *Appl. Spectrosc.* **2017**, 72, 3, 378 – 391. (<https://doi.org/10.1177/0003702817724164>)
- Dominic V. Poerio, Steven D. Brown. "Stacked Interval Sparse Partial Least Squares Regression Analysis." *Chemom. Intell. Lab. Syst.* **2017**, 166, 49 – 60. (<https://doi.org/10.1016/j.chemolab.2017.03.006>)
- Casey Kneale, Dominic Poerio, Karl S. Booksh. "Optimized Spatial Partitioning via Minimal Swarm Intelligence." arXiv Statistics. January 20, 2017. (<https://doi.org/10.48550/arXiv.1701.05553>)

Invited and Contributed Talks

- LFortran Developer Team. "LFortran: Interactive LLVM-based Fortran Compiler for Modern Architectures". FortranCon 2021, Virtual Conference, September 23, 2021, presented by Ondřej Čertík.

- Steven D. Brown, Dominic V. Poerio. "Stacking the Deck in Calibration: Better Models and Better Transfers with Stacked Calibration Methods." Eastern Analytical Symposium, Princeton, NJ, Nov 14, 2017, presented by Steven Brown.
- Dominic V. Poerio, Steven D. Brown. "Robust Regression Models in Unseen Domains by Wavelet Scale Projection". Delaware Data Science Symposium, Newark, DE, May 12, 2017, presented by Dominic Poerio

Open Source Contributions

MCRT, <https://gitlab.com/dpoe/mcrt>

November 2021-Present

Owner/Developer

- MCRT is an OpenMP parallelized C++ program for performing Monte Carlo radiative transfer simulations of plane parallel systems (atmosphere/ocean system, multilayer thin films, etc.)
- MCRT contains features not present in any other open source radiative transfer program, such as complete handling of refraction and total internal reflection
- Designed a test suite via CTest to ensure reliability and conformance with other methods

LFortran, <https://github.com/lfortran/lfortran>

February 2021-January 2022 (Currently inactive)

Contributor/Developer

- LFortran is a Fortran compiler, written in C++, targeting various languages (LLVM IR, x64 assembly, C++), also implementing a read-eval-print loop (REPL) and Jupyter kernel
- Implemented various features of the Fortran language into the LLVM backend, primarily focused on procedures (nested procedures, callbacks/procedures as procedure arguments, recursion, closures, etc.)
- Developed logic for determining statement completeness in the REPL to automatically detect that the user is typing a multiline statement

Other Achievements/Recognition

- Primary developer of the Color Palette Optimizer application, part of Axalta's Radar Transmission Simulator (ARTS) with Color Palette Optimizer for Autonomous Vehicles, winner of a 2022 BIG Innovation Award

Education

University of Delaware

Graduated May 2018

Ph.D. in Chemistry

Thesis title: "Localization approaches for predictive models based on spectral or process data with diverse applications." (<http://udspace.udel.edu/handle/19716/23727>)

Pennsylvania State University

Graduated May 2014

B.S. in Biochemistry