

Nathan McCormick

Sherwin Williams
PCG Innovation Group

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[LinkedIn](#)

Education

MS in Biomedical Engineering

University of Minnesota

Sept 2020 - May 2023, Minneapolis MN (GPA: 3.95)

Advanced Biomedical Imaging (CT, MRI, PET, SPECT, EEG, MEG, ultrasound),
Advanced Bioelectricity and Instrumentation (cardiac physiology/disorders, ECG),
Statistics, Applied Regression Analysis, Quality and Reliability Engineering

Bachelor's in Biology

University of Dallas

Sept 2009 - May 2013, Irving TX *Cum Laude*

Anatomy, Molecular Biology, Microbiology, Vector Calculus, General Physics,
General Chemistry, Organic Chemistry, Analytical Chemistry

Experience

Sherwin Williams

Sr. Chemist
PCG Innovation
March 2022 - Present

Chemist II
PCG Innovation
May 2019 - March 2022

Chemist I
Advanced Liquid Platforms
Jan 2017 - May 2019

Associate Chemist
Commercial Vehicle Group
Sept 2014 - Jan 2017

Contractor
Truck/Trailer Group
March 2014 - Sept 2014

Automated Image Analysis of Corrosion

2020 - Present

Designed and built a robotic system to automate measurement of corrosion panels, winning the 2022 Percy Neyman award for Science. Implemented image analysis, data processing, and statistical testing in Python. Trained a TensorFlow convolutional neural network to segment images. Used GPU acceleration, image augmentation, and weighted classes to achieve 99.9% accuracy and 95% time savings. Responsible for mechanical and electrical design, controls, and contract manufacturing.

Automated EIS Data Processing

2023 - Present

Used Python, HTML, JavaScript, and Docker to build a fully functional web application that automates electrochemical impedance spectroscopy data processing for the Pittsburgh Packaging Group. Implemented Kramers-Kronig residuals analysis, log least squares curve fitting, circuit model selection, and automated statistical analysis.

Surface Roughness Measurement

2022 - Present

Developed a method to quantify the surface roughness induced by the absorption of a liquid coating into a porous substrate. Used Python to process data from a 3D structured light scanner, algorithmically orient the surface using vector calculus, compensate for surface curvature, and coerce the data from an irregular point cloud into an image. Used imaged analysis to quantify surface roughness.

Corrosion Rate Characterization Method

2020 - Present

Invented a novel, contactless method to measure the corrosion rate of steel substrates. Designed and built an instrument that generates a change in AC voltage magnitude as a function of corrosion. Screened for optimal settings using DOE methodology in Minitab. Used Python to fully automate sample placement, Keithley DMM6500 data collection, Fourier filtering, temperature and baseline compensation, and report generation.

Skills

Machine/Deep Learning
DNN, CNN
Decision Trees
Random Forest
Hierarchical Clustering
k-NN, k Means, SVM, PCA
Regression
Multiple Linear, Logistic
Lasso, Ridge, Elastic Net
Model Validation
Signal Processing
Fourier Transform
Signal Averaging (ERP)
Differential Equations
Linear Algebra
Probability/Statistics
Hypothesis Testing
Data Wrangling
Data Analysis
Algorithm Development
Minitab, Python, R
Cross-site Collaboration
Technical Communication
Technical Writing
New Product Development
Proof of Concept
Patent Disclosures

Interests

Partial Differential
Equations
Espresso
Ultimate Frisbee

Patents and Publications

Awards

Simulation of Tumor Growth *(MS Class Project)*

2022

Modeled tumor response to a combination of chemotherapy, radiation, and immunotherapy. Numerically solved a system of six coupled differential equations using Python. Explored effect of initial conditions on tumor survival.

Mathematical Model of Solar Heat Gain in Insulative Coatings

2022

Developed and programmed a heat transfer model of coating surface temperature that includes coating reflectance, emissivity, thickness, and thermal conductivity. Conducted a Monte Carlo simulation to determine which coating parameters offer the best opportunity for optimization. Project was presented at the 2023 Association for Materials Protection and Performance (AMPP) Annual Conference.

Automated Statistical Inference

2022

Developed a tool to quantify correlations between formula contents and performance metrics that dynamically adjusts p-value thresholds for data set size and multiple testing. Deployed the tool with an intuitive user interface that visualizes significance thresholds and results, aiding interpretation by end users.

Air Release Characterization Method

2021 - 2022

Invented a microscopic image analysis method to quantify air release of curing coatings. Used Python and machine vision to provide a real time quantification of bubble rise and pop time constants, enabling a mechanistic understanding of air entrapment. Developed graphic user interface for distribution to R&D lab groups.

Latent Base Catalyst

2018 - 2020

Invented patent pending latent base crosslinking catalyst for a premium General Industrial product line, winning the 2019 Percy Neyman award for Innovation. Worked cross-functionally with Regulatory Group to define global regulatory strategy. Collaborated with Analytical Group in Cleveland, OH to generate C-NMR data and validate synthesis process.

Manufacturing and Commercialization Support

2014 - 2018

Commercialized \$3M of new business in the light industrial market at various customers. Invented a patent pending method for improving wet film catalyst latency.

Heat Buildup for Thermally Insulative Coatings due to Solar Exposure:
Efforts in Modeling and Prediction - 2023 AMPP Annual Conference

[US20220332884A1](#) - Coating Compositions and Methods with
Polyfunctional Carbamate Salt (2020)

[US20200079965A1](#) - Polyurethane Coating Composition (2019)

2022 Sherwin Williams Percy Neyman Award - Science
2019 Sherwin Williams Percy Neyman Award - Innovation
2009 Vex Robotics World Championship Innovation Award