Nathan McCormick

Biomedical Engineer
Scientific Programmer
Chemist

4411 155th Ave NE
Ham Lake, MN 55304

603 703 7139
njmccormick76@gmail.com

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 Engineering, Physiology, Differential Equations, Linear Algebra, Functional Genomics, Systems Biology, and Bioinformatics

Research Engineer - Translational NeuroEngineering Lab   May 2022 - Aug 2022

Refactored existing data pipeline in R by converting nested loops to vectorized operations, reducing file processing time from 15 minutes to 12 seconds. Built pipeline to generate plots of lab rat location overlaid with behavior responses.

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.

Skills

Machine/Deep Learning
  DNN, CNN (TensorFlow)
  Random Forest
  Hierarchical Clustering
  k-NN, k Means, SVM, PCA
Regression
  Multiple Linear, Logistic
  Lasso, Ridge, Elastic Net
Signal Processing
  Fourier Transform
  Signal Averaging (ERP)
Computer Vision
Robotics
Statistics and Probability
Experimental Design (DOE)
Python, R, Minitab
Git, GitHub
Docker

Cross-site Collaboration
Rapid Prototyping
Problem Solving

Interests

Partial Differential
Equations
C++, HTML, JavaScript
Linux
Espresso
Ultimate Frisbee

—

Patents and Publications

—

Awards

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, and baseline correction.

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 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 GUI 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 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