Joshua Dodrill

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EDUCATION

University of Colorado Boulder | Boulder, CO — August 2020 – May 2024
B.S. Chemical and Biological Engineering, Minor: Computer Science

RESEARCH EXPERIENCE

Design Team Member — Spring 2024
Genentech Monoclonal Antibody Production Design and Analysis

- Developed various high-level technoeconomic models comparing three literature-based production schemes of mAbs with the goal of maximizing ROI and IRR while considering environmental factors
- Performed in-depth modeling of protein A chromatography columns in series using the Chromatography Analysis and Design Toolkit (CADET) to develop a mechanistic model utilizing mass transfer, diffusion, and binding kinetics

WORK EXPERIENCE

Amalgamated Research, LLC | Twin Falls, ID — October 2024 – Present
Research Chemical Engineer

- Designed and optimized a variety of separation and purification processes for diverse applications at the laboratory and pilot-scale, including direct lithium extraction (DLE), beet molasses desugarization, lactose demineralization, and various hydrometallurgical separations
- Provided engineering data to partners to generate industrial-scale PFDs and P&IDs
- Developed and implemented automated simulated moving bed control programs at the pilot-scale using an OPTO 22 PLC and HMI
- Performed comprehensive troubleshooting of separation equipment, process instrumentation, and control programming during on-site system commissioning
- Commissioned pilot-scale equipment at client sites internationally and domestically
- Led on-site training for engineers and operators on separation theory, equipment control, optimization, and system monitoring
- Led customer projects from the laboratory to pilot scale and delivered cohesive presentations summarizing testing results, economic projections, chemical consumption, process performance, and equipment sizing
- Developed SOPs and Take 5 documents to ensure safe handling of concentrated acids, bases, oxidizers, and reducing agents and to support the repeatability of experimentation

TECHNICAL SKILLS

- C++, Python, Visual Basic for Applications (VBA), Git, MATLAB, CADET, Minitab, Microsoft Excel, Aspen, Superpro, AutoCAD, DoE
- Design and implementation of Programmable Logic Controllers (PLC)
- Strong understanding of classical control theory
- Experience performing step tests for empirical characterization of process responses
- Practical implementation of PID controllers in a lab setting, tuning of PID controllers in closed loop configurations, stability and robustness analysis of PID controllers
- Ability to apply a variety of advanced statistical tests (z-tests, T-tests, chi-squared tests, F-tests, comparison of binomial proportions, and others) to diverse data sets
- Regression model building (linear, multilinear, nonlinear) including confidence intervals on model parameters, analysis of residuals, ability to assess goodness of fit and discriminate among competing models

CERTIFICATIONS

- Passed Fundamentals of Engineering Exam (EIT) — May 2024
- Project Initiation and Planning (*University of Illinois Urbana-Champaign*) — May 2025

PERSONAL PROJECTS

Motorcycle Restoration — Summer 2023
1996 Honda CBR 600 F3

- Applied troubleshooting and mechanical skills to perform a complete restoration while adhering to a pre-defined budget and deadline
- Adapted to solve practical problems and apply engineering principles to an unfamiliar, complex system
- Knowledgeable of fuel supply and carburation, electronics, engine components, and suspension