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William Pangestu

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Education

Bachelor of Science – Chemical Engineering

September 2023 – August 2025 *University of California – San Diego*

Relevant Coursework: Mass and Energy Balances, Introduction to Biochemical Engineering, Polymeric Materials, Chemical Plant & Process Design, Separation Processes, Chemical Process Dynamics & Control, Probability and Statistical Methods, Thermodynamics, Chemical Reaction Engineering, Fluid Mechanics, Supervised Machine Learning

General Education and STEM Preparation

April 2021 – August 2023 *De Anza College – Cupertino, CA*

Relevant Coursework: Calculus I–III, Differential Equations, Physics for Engineers, Organic Chemistry, General Chemistry, Biology, C++,

Experience

Process Improvement Intern – UCC1 Polyethylene Plant

July – August 2024 *PT Chandra Asri Pacific, Indonesia*

- Identified and streamlined manual diagnostic processes in reactor and extruder systems using Python-based data analysis.
- Developed a machine learning pipeline in Google Colab to assist with root cause analysis of reactor shutdowns caused by agglomerate buildup on distribution plates.
- Applied correlation analysis, feature importance via Random Forest, PCA, and regression models to interpret process data and highlight critical failure-driving parameters.
- Built an analysis tool to evaluate mixer–extruder energy efficiency, proposing optimized operational settings for reduced energy consumption.
- Presented technical findings and tool demonstrations to engineering mentors; work enabled faster and more scalable process troubleshooting.
- Worked independently with periodic mentor consultations; gained cross-functional plant exposure through structured walkthroughs of purification, reaction, finishing, and vent recovery units.

Founder & President – De Anza Engineering Society (DAES)

Apr 2023 – Jul 2023 *De Anza College – Cupertino, CA*

- Established DAES as a multidisciplinary club to foster engineering community and hands-on experience among STEM students; the club has since grown beyond 120 members and remains active.
- Led a team of 7 officers by defining roles, coordinating operations, and mentoring the next president for long-term leadership continuity.
- Spearheaded the club's first technical project: a self-driving vehicle prototype combining teamwork, programming, and circuit design.
- Organized club-wide events and recruitment efforts, developing strong public speaking and logistical planning skills.
- Cultivated an inclusive and collaborative environment for students to explore engineering concepts outside the classroom.

STEM Tutor – Math and Science Resource Center (MSRC) & MPS Program

Nov 2021 – Mar 2023 *De Anza College – Cupertino, CA*

- Tutored 20+ students weekly in Calculus, Trigonometry, Differential Equations, General Chemistry, Physics, and Biology through both in-person and online drop-in sessions.
- Delivered tailored one-on-one tutoring for a General Chemistry student over a full academic quarter, resulting in significant performance improvement and strengthened learning strategies.
- Strengthened students' problem-solving abilities by teaching structured study techniques, promoting critical thinking, and building confidence through curiosity-driven engagement.
- Adapted explanations to accommodate diverse learning styles and academic backgrounds using creative analogies and interactive techniques to demystify complex concepts.

- Fostered an inclusive, supportive learning environment across multiple subjects and formats, enhancing peer-to-peer learning and communication.

Project Lead – Full House Charity Poker Event
Oct 2022 – Mar 2023 *Philanthropic Initiative – San Francisco Bay Area*

- Spearheaded the planning and execution of a charity poker tournament that raised over $2,800 for local causes and attracted 80+ guests.
- Led a team of 30+ volunteers across operations, logistics, food, guest services, and marketing, ensuring a smooth and engaging event experience.
- Oversaw key project functions including web development, sponsorship coordination, and outreach within targeted student communities.
- Enhanced team coordination and communication to manage dynamic real-time challenges during the event.
- Applied financial analysis to optimize event spending and maximize charitable contributions.

Finance Officer – PERMIAS San Francisco Bay Area
Aug 2022 – May 2023 *Indonesian Student Association – Bay Area Chapter*

- Managed budgeting, reimbursements, and event funding for an Indonesian-American student organization serving youth across the Bay Area.
- Raised over $3,000—PERMIAS SFBA's highest historical fundraising total—to support cultural, social, and career development events.
- Collaborated with fellow officers to plan and fund sports tournaments, networking mixers, and professional panels.
- Coordinated with Indonesian-based vendors and sponsors to secure funding and partnerships.
- Created financial tracking systems and reports using Excel to ensure transparency and future continuity.

Projects

Direct Air Capture Plant Design using Calcium Looping
January 2024 – June 2024

- Designed a full-scale Direct Air Capture facility using calcium looping for CO_2 removal as part of UC San Diego's senior capstone project.
- Simulated and optimized process units—including preheaters, a high-temperature calciner, separators, and compressors—using Aspen Plus.
- Sized equipment, estimated utilities, and performed energy integration and economic analysis (NPV, IRR, capital and OPEX estimates).
- Conducted HAZOP safety analysis using Aspen stream data and designed full P&ID.
- Organized Gantt Chart to structure and coordinate group efforts.
- Worked in a team of four, rotating roles across design, simulation, safety, and cost modeling to deliver a comprehensive final report.

Chemical Engineering Process Laboratory
January 2024 – June 2024 *University of California – San Diego*

- Characterized heat transfer performance in a Plate Heat Exchanger and derived Nusselt number correlation using MATLAB.
- Evaluated reaction kinetics in a UV Photocatalytic Reactor and determined methylene blue degradation to be first-order.
- Identified optimal operating conditions in a spiral-wound Reverse Osmosis system through pressure–flow experiments.
- Synthesized liposome nanoparticles and analyzed their hydrodynamic diameter and polydispersity using Dynamic Light Scattering (DLS).
- Modeled enthalpy changes in a Cooling Tower system and estimated NTU using psychrometric data and water-air flow dynamics.
- Constructed and analyzed polarization and power curves of a PEM Fuel Cell to evaluate performance under varied load conditions.
- Tuned a PID controller to facilitate a titration process to stabilize about a pH setpoint.

Additional Projects (Ongoing)

- **Automated pH Control System**: Designed an automated pH control system integrating ML-driven feedback loops and Arduino-actuated valves to optimize acid/base dosing; applied LabVIEW-style logic for

process simulation and experimental control.

- **Python-Driven CAD Automation**: Built Python scripts using the FreeCAD API to auto-generate and parametrize 3D parts from process data, reducing manual design time by 75%.

Skills

Automation & Testing	Python; C++; Supervised ML; control logic; Arduino
Process Design & Safety	PFD & P&ID development; HAZOP/RCA; continuous processes
Optimization & CI	Pinch analysis; Lean Six Sigma principles; OPEX/CAPEX trade-off analyses
Project & Operations	Production scheduling; shift handoffs; continuous-flow startup/shutdown
Software & Tools	MS Office; LabVIEW; Aspen Plus; MATLAB/Simulink; SolidWorks (CAD)
Travel	Willing to work on-site and travel for short-term missions.

Certifications & Memberships

- Supervised Machine Learning
- Six Sigma Green Belt (in progress)
- American Institute of Chemical Engineers (AIChE)