Quynh Tran

FE-Certified Chemical Engineer • Lean Six Sigma Green Belt • M.S. Chemical Engineering (UCSD)
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EDUCATION

University of California San Diego (UCSD), Jacobs School of Engineering
Master of Science (M.S.) in Chemical Engineering | *ABET-accredited program* — *Sep 2024 - June 2025*
Bachelor of Science (B.S.) in Chemical Engineering | *Nanotechnology Specialization* — *Sep 2020 - June 2024*

SKILLS & CERTIFICATIONS

- **Programming & Analytics:** Python (NumPy, pandas, scikit-learn, TensorFlow, PyTorch), MATLAB, LabVIEW, Minitab, SPC (Statistical Process Control), Excel, Data Visualization (Tableau, matplotlib, seaborn), SQL (Structured Query Language)
- **Process & Modeling:** Aspen Plus, HYSYS, AutoCAD, Simulink, Process Hazard Analysis (HAZOP, PFD, P&ID)
- **Certifications**: FE Chemical - NCEES; Machine Learning Specialization - DeepLearning.AI; Lean Six Sigma Green Belt - CSSC

WORK EXPERIENCE

Physics/ Chemistry/ Astronomy Expert - Mercor, Remote — *Oct 2025-Present*

- Conduct **data quality and validation reviews** for 200+ STEM Olympiad case problems, correcting inaccuracies and standardizing structure to improve AI model reasoning reliability.
- **Collaborate cross-functionally** with project leads and content teams through Airtable and Overleaf to resolve formatting issues, align on requirements, and consistently deliver accurate, high-quality outputs on time.

Quality Assurance/ Quality Control (QA/QC) Wastewater Intern - *Cleantech Co., LTD., Vietnam* — *June-Sep* 2023

- Analyzed 100+ wastewater samples weekly and supported 30+ QA inspections to ensure compliance with national water standards, reducing non-compliance incidents by 10%.
- Optimized ultrafiltration and reverse osmosis systems through troubleshooting and process adjustments, increasing **filtration efficiency** by **15%** and enhancing system reliability for consistent water quality.

INDUSTRY PROJECTS

Tetraethyl Orthosilicate (TEOS) Purification Capstone Design - *EMD Electronics* — *Jan - June 2024*

- Designed and validated batch and continuous distillation processes to purify TEOS to **99.99%** for 1,000 metric tons/year semiconductor production, achieving **92.2% yield** and **4× efficiency** improvement of continuous over batch processing.
- Utilized Aspen Plus for **process simulations**, **equipment sizing calculations** & linear regression. Performed **Economic Data Analysis** to calculate a Net Present Value of $7.34 billion over a 10-year plant life.
- Conducted comprehensive **process safety and control** evaluations (**HAZOP, PFD, P&ID**) to ensure compliance with semiconductor manufacturing standards and alignment of design with cost and safety objectives.

Ethanol Production Optimization Project - *AIChE at UCSD* — *Jan 2022 - Jan 2023*

- Designed a scalable 2G bio-ethanol fermentation prototype using lignocellulosic biomass as a sustainable fossil fuel alternative, collaborating with international teams in Malaysia and Brazil to refine experimental setups and optimize production parameters.

ACADEMIC PROJECTS

Machine Learning for Materials Properties - UCSD (github link) — *Mar - June 2025*

- Queried and filtered **60k+ inorganic materials** from the **MatPES database** using **SQL**, integrating with **Python (pandas, scikit-learn)** to engineer 90+ structural and compositional features.
- Trained and optimized **Ridge Regression** and **Gradient Boosting** models for cohesive energy prediction, achieving a **0.072 eV/atom MSE** and outperforming baseline models by **88%**.
- Applied **matplotlib** and **seaborn** for advanced **data visualization**, analyzing feature correlations, residual distributions, and structure–property trends to interpret model performance and material stability.

Chemical Engineering Experimental Methods - *UCSD* — *Jan - June 2024*

- *pH Controller:* Developed and tuned a **non-linear PID controller** in **LabVIEW** using direct synthesis, achieving **10×** faster response with minimal offset and no oscillation, outperforming traditional IAE tuning.
- *Methylene Blue Degradation:* Determined the photocatalytic degradation kinetics of methylene blue in a UV reactor by using a calibrated **spectrophotometer** to analyze changes in absorbance and assess the catalytic efficiency of hydrogen peroxide.
- *Nanoparticle Size Reduction:* Assessed liposome nanoparticle size and polydispersity index using **Dynamic Light Scattering,** reduced the average size to 100 nm by optimizing extrusion cycles and cholesterol concentration.

Capstone - Solar Thermal Collector (Chemical Engineering Experimental Methods) - *UCSD* — *Mar - June 2023*

- Simulated solar collector performance using **MATLAB, Arduino,** and **Capstone**; applied **ASHRAE standards** to optimize thermal efficiency and improved prediction accuracy by 15%.