

Education

University of Washington, Seattle, WA, USA

PhD in Chemical Engineering

2020 – June 2025

University of Washington, Seattle, WA, USA

Master of Science in Chemical Engineering (Data Science)

2020 – 2022

University of South Florida, Tampa, FL, USA

Bachelor of Science in Chemical Engineering

2016 – 2020

Skills

Machine Learning

- Bayesian Optimization
- Gaussian Processes
- Active Learning
- Deep Learning
- Functional Data

Physical Sciences

- Biological and Soft Matter
- Nanotechnology
- HT-Experimentation
- Small Angle Scattering
- Electron Microscopy

Software Skills

- Scikit-learn, Scipy, Pandas
- PyTorch, BoTorch, CUDA
- MATLAB, Simulink
- Molecular Simulations
- Fusion 360 (CAD)

Research Experience

Pozzo Research Group

University of Washington

2020 – Present

Seattle, WA, USA

- Combined machine learning techniques with high throughput experimentation to analyze and predict the structure and functionality of various soft matter systems, including proteins, peptoids, DNA, lipids, inorganic nanoparticles, and emulsions.
- Developed data-driven methods for executing timed interventions in dynamic soft matter experiments.
- Used numerical methods for simulating small-angle scattering curves of large biomolecular assemblies and designed model-fitting algorithms.
- Performed SAXS, SANS, DLS, UV-Vis spectroscopy, SEM and TEM characterization on various colloidal systems.
- Led lab safety initiatives, including training, waste management, and compliance inspections for the Pozzo Research Group, achieving a 100% safety rating.

Gonzalez Research Group

University of South Florida

July 2019 – May 2020

Tampa, FL, USA

- Led a research project to increase the specificity of an acetaldehyde dehydrogenase variant on formaldehyde.
- Utilized protein visualization programs such as ChimeraX and modeling simulation software such as AutoDock
- Proposed mutations to decrease the volume of the active site to accommodate the new substrate.

Experiments at Large Scale Facilities

Structural Analysis of mRNA Delivery Vectors as a Function of pH

High Flux Isotope Reactor

September 2023

Oak Ridge, TN, USA

- Used Bio-SANS to investigate the effect of pH on the structure of lipid nanoparticles for the delivery of mRNA.

Structural Investigation of the Thaumatin I Protein

PETRA III Max von Laue Experimental Hall

March 2023

Hamburg, Germany

- Used Bio-SAXS and protein crystallography to investigate the structure of the Thaumatin I protein.

Hercules European School 2023

European Photon and Neutron Science Campus

March 2023

Grenoble, France

- Selected as a participant for a 5-week course for performing science at large-scale facilities that include using neutrons, x-ray synchrotron radiation, and free electron lasers for condensed matter studies.
- Performed experiments and data analyses at various X-ray, neutron, and XFEL beamlines.

High Throughput USAXS and Active Learning to Optimize Nanostructures

Advanced Photon Source

February, June 2022

Lemont, IL, USA

- Obtained scattering data (USAXS/SAXS) for 550 gold nanoparticle samples in roughly 40 hours.
- Processed and analyzed the scattering data to determine the nanoparticle's morphology and size.
- Investigated the structural changes of the growth of a gold nanorod and a nanosphere using time-resolved USAXS.

Software

Small Angle Scattering Simulations

January 2023 - Present

[Github Link](#)

- An inexpensive numerical method (O1 complexity) to efficiently model large biomolecular assemblies and simulate their small angle scattering curves
- Includes a model-fitting algorithm to fit experimental scattering data

Data Driven Exploration

January 2023 – August 2023

[Github Link](#)

- Python code that involves using a Gaussian Processes classifier to actively suggest new experiments
- Code for the visualization of large high-dimensional datasets

OTTO - OT2 Time and Order

December 2021 – March 2023

[Github Link](#)

- Code that allows a liquid handling robot to vary the volume, time delay, and order of the mixing of stock solutions
- Developed a method to optimize the scheduling of the pipetting steps (similar to the optimization of a Gantt chart), which reduced the pipetting time by up to 80%

Mentorship, Teaching, and Outreach

Reviewer of Research Proposals

Online

Seattle WA, USA

2024-2025

- Reviewed applications for the UW Distinguished Young Scholar Seminar
- Reviewed applications for the US DOE Office of Science Graduate Student Research (SCGSR) program

Research Experience for Undergraduates - Mentor

University of Washington

June 2022 – Present

Seattle, WA, USA

- Mentored 3 undergraduate students

Nanomaterials Engineering via High-throughput Robotic Experimentation

University of Washington – Material Science and Engineering

December 2021 – April 2022

Seattle, WA, USA

- Designed a lab module for the introduction to material science class.

- Developed a code in a Jupyter notebook for students to run gold nanoparticle synthesis protocols using an OpenTrons OT2 liquid handling robot.
- Developed an interactive Jupyter notebook for the students to visualize the data that they collected.

Chemical Engineering Teaching Assistant

University of Washington – Chemical Engineering

December 2021 – December 2024

Seattle, WA, USA

- Assisted in the instruction and facilitation of undergraduate lab sessions focused on colloid science and its applications in chemical engineering.
- Developed and implemented supplemental instructional materials, including lab manuals and visual aids, enhancing student understanding of complex concepts.

Publications and Preprints

Shunzhi Wang, Andrew Favor, Ryan Daniel Kibler, Joshua Morris Lubner, Andrew J Borst, Nicolas Coudray, Rachel Redler, **Huat Thart Chiang**, William Sheffler, Yang Hsia, Zhe Li, Damian Charles Ekiert, Gira Bhabha, Lilo Pozzo, David Baker, “Bond-centric modular design of protein assemblies”. *Nature Materials*. (2025)

Huat Thart Chiang, Zhiyin Zhang, Kiran Vaddi, F. Akif Tezcan and Lilo. D Pozzo, “Efficient Analysis of Small-Angle Scattering Curves for Large Biomolecular Assemblies Using Monte Carlo Methods”. *Journal of Applied Crystallography*. (2025)

Kiran Vaddi, **Huat Thart Chiang**, and Lilo. D Pozzo, “Autonomous Phase Mapping of Gold Nanoparticles Synthesis with Differentiable Models of Spectral Shape”. *Chemrxiv*. (2025)

Zhiyin Zhang, **Huat Thart Chiang**, Ying Xia, Nicole Avakyan, Ravi Sonani, Fengbin Wang, Edward H. Egelman, James J. De Yoreo, Lilo D. Pozzo, and F. Akif Tezcan, “Design of Light- and Chemically-Responsive Protein Assemblies through Host-Guest Interactions”. *Chem*. (2025)

Christopher Lowe, Helen Larson, Yifeng Cai, **Huat Thart Chiang**, Lilo Pozzo, Francois Baneyx, Brandi Cossairt “Induced Chirality in QDs Using Thermoresponsive Elastin-Like Polypeptides”. *Langmuir*. (2024)

Huat Thart Chiang, Kiran Vaddi, Lilo D. Pozzo “Data-Driven Exploration of Silver Nanoplate Formation in Multidimensional Chemical Design Spaces”. *Digital Discovery*. (2024)

Kacper J. Lachowski, **Huat Thart Chiang**, Kaylyn Torkelson, Wenhao Zhou, Shuai Zhang, Jim Pfaendtner, Lilo D. Pozzo. “Anisotropic Gold Nanomaterial Synthesis Using Peptide Facet Specificity and Timed Intervention”. *Langmuir*. (2023)

Sakshi Yadav Schmid, Kacper Lachowski, **Huat Thart Chiang**, Lilo Pozzo, Jim De Yoreo, Shuai Zhang. “Mechanisms of Biomolecular Self-Assembly Investigated Through *In Situ* Observations of Structures and Dynamics”. *Angewandte Chemie*. (2023)

Kiran Vaddi, **Huat Thart Chiang**, Lilo D. Pozzo. “Autonomous retrosynthesis of gold nanoparticles via spectral shape matching”. *Digital Discovery*. (2022)

Awards

Materials Research Society Spring Meeting

Best Oral Presentation of the Symposium, April 2025

AIChE Poster Competition

1st place in the poster competition at the annual meeting, October 2024

University of Washington - Clean Energy Institute

Travel Grant, July 2022, March 2023

The D. D. and Sylvia M. Drowley Fellowship

UW ChemE, 2020

Runstad Family Endowed Fellowship in Chemical Engineering

UW ChemE, 2020

Chemical Engineering Alumni Fellowship Endowment

UW ChemE, 2020

Eugene Half Marathon Finisher

April 2025