Thomas Minh Nguyen

Davis, CA
919-619-5766 | tmhnguyen@ucdavis.edu | https://linkedin.com/in/thomas-minh-nguyen
https://thomasmhnguyen.github.io

EDUCATION

University of California-Davis Davis, CA
Ph.D. in Chemical Engineering | GPA: 3.69/4.00 Sep. 2019 - Jun. 2025
Research focus: Large-scale predictive physics-based modeling and simulations of complex systems for engineering and
biomedical applications

North Carolina State University Raleigh, NC
B.S. in Chemical & Biomolecular Engineering | GPA: 3.77/4.00 Aug. 2013 - May 2017

WORK EXPERIENCE

Graduate Student Researcher Davis, CA
UC Davis Department of Chemical Engineering Jan. 2020 – Jun 2025

- Developed and maintained Python-based code-base for **multi-scale computational fluid dynamics (CFD) simulations, Multiphysics models, post-processing, and data analysis** in a start-up research setting.
- Enabled **100x faster decision-making** and **reduced analysis times by over 500 hours** by refactoring legacy simulation codebase using **object-oriented programing (OOP), version control (Git),** and **algorithm optimization.**
- Developed a **physics-informed neural network (PINN) model** to accelerate predicting heat & mass transfer in systems.
- Authored **35+** technical documents and conference presentations, translating complex modeling and data analysis results into actionable insights for non-technical audiences and stakeholders.
- ***Project:*** *Design and optimization of prototype fluidic hardware systems (**2024 - 2025**)*
    - Collaborated with experimental teams to build, apply, and refine computational predictive models based on experimental data.
    - Identified engineering design decisions that resulted in a **25% improvement** in system efficiency from **500+ CFD simulations** and **experimental data**.
- ***Project:*** *Analysis and Prediction of Structural Deformation Patterns (**2020 - 2022**)*
    - Applied **modal decomposition** and **linear stability analysis** techniques to identify dominant spatial deformation patterns in simulation data, achieving over **75% accuracy**.

Teaching Assistant Davis, CA
UC Davis Department of Chemical Engineering Jan. 2021 – Jun. 2025

- Acted as technical advisor and mentor for 100+ individual students, delivering expert guidance support for scientific programming and data analysis needs.
- Improved students' grades on subsequent assignments by at least **30%** through mentoring and detailed responses to needs.

Thomas Minh Nguyen

Davis, CA

919-619-5766 | tmhnguyen@ucdavis.edu | https://linkedin.com/in/thomas-minh-nguyen

https://thomasmhnguyen.github.io

Post-Baccalaureate (Post-bac) Research Fellow Baltimore, MD

National Institute on Aging, NIH Oct. 2017 - Aug. 2019

- Built scalable **ELT data pipelines** with **Python** and **Bash** to automate processing of large-scale and high-dimensional biological datasets.
- Applied algorithm optimization techniques on HPC systems for probabilistic models, reducing **resource utilization by 65%** and reducing **calculation times by over 70%**.
- Diagnosed and resolved computational data quality and pipeline issues, eliminating **$15,000** in redundant data generation.
- Mentored junior researchers on automated workflows on **high-performance computing infrastructure**, increasing team productivity by **35%.**
- ***Project:*** *Statistical Analysis of Longitudinal Data (**2017 - 2019**)*
    - Developed **predictive models** of biological data diversity using **data from public databases (**NCBI SRA/GEO). Applied predictive models to own dataset to draw inferences about immune system aging.
    - Developed **advanced statistical models** for **time-series data**, improving data forecasting accuracy by at least **20%**.
- ***Project:*** *Predictive Aging Analysis of CD8+ T-cells from high-dimensional data (**2018 - 2019**)*
    - Applied a **self-organizing map machine learning model** to classify **2M+ FACS-sorted CD8+ T-cells**. Validated cluster consistency via cross-dataset correlation analysis, achieving **89%** similarity.

Flexible Volume Manufacturing Intern Durham, NC

Biogen Jun. 2017 - Aug. 2017

- Collaborated with engineers to audit and streamline reagent usage across manufacturing production, identifying **37 critical chemical reagents** for purchasing and reducing preparation time by **~16 hours/week**.
- Evaluated integration of third-party materials into existing manufacturing workflows, identifying cost-saving opportunities and reducing manufacturing expenses by **$500/month**.
- Conducted **3 process development studies**, to support clinical trial material production, complying to **FDA cGMP (21 CFR Part 210/211)** regulations.
- Conducted sensitivity analysis on process parameters for chemical mixing processes, identifying parameters that eliminated **10 hours/week** in labor.
- Utilized **SuperPro Process modeling software** to perform **protein production unit operation modeling** and **scale-up calculations**, contributing to early-stage process design and feasibility analysis.

Thomas Minh Nguyen

Davis, CA

919-619-5766 | tmhnguyen@ucdavis.edu | https://linkedin.com/in/thomas-minh-nguyen

https://thomasmhnguyen.github.io

Small Scale Manufacturing Intern Holly Springs, NC

Seqirus May. 2016 - Aug. 2016

- Diagnosed production bottlenecks associated with **2x scale-up** in production of vaccine manufacturing, identifying inefficiencies contributing to a **45% drop** in overall productivity.
- Conducted **risk assessment** of process materials to determine safety impact on employees. Authored regulatory documents to execute change of process materials, minimizing **safety risk and hazards**.
- Worked with manufacturing employees to properly commission/decommission manufacturing equipment. Worked with supply chain employees to update SAP supply chain software for manufacturing processes and inventory management.

Biomanufacturing Intern Raleigh, NC

BTEC at North Carolina State University Aug. 2015 - May 2016

- Operated and troubleshooted **lab-scale downstream bioprocessing equipment** including UF/DF systems, centrifuges, chromatography columns, and lab equipment sensors to support protein purification and harvest workflows.
- Revised experimental protocols based on Failure Modes and Effects Analysis (**FMEA**) and Corrective and Preventative Actions (**CAPAs**) results.
- Applied DOE methodologies to optimize performance of membrane-based separation processes for biological proteins, resulting in a **20% improvement** in product quality.

Process Engineer Intern Morrisville, NC

Integrated Project Services (IPS) May 2015 - Aug. 2015

- Optimized workflow to review and modify **engineering schematics** (P&IDs, PFDs) for senior-level PEs and other engineers, increasing team efficiency by **25%**.
- Specified piping requirements by calculating pressure drop across pipes.

TECHNICAL SKILLS

Programming/Data Science: Python (NumPy, SciPy, Pandas, Scikit-learn, OpenCV, PyTorch), MATLAB, R
Scripting: Bash/Linux Shell, High-Performance Computing (HPC) Systems, slurm workload manager
Modeling and Simulations: Physics-based(fluid dynamics (CFD), fluid-structure interactions (FSI), thermal), numerical methods (finite differences (FDM), finite elements (FEM)), ODE/PDE solvers, predictive modeling, ML (classification, physics-baed)
Data Analysis: time-series analysis, statistical analysis, image/signal processing
Modeling Applications, Tools: COMSOL Multiphysics, Ansys Fluent, Jupyter Notebooks, GitHub, Git, GraphPad Prism, AutoCAD, Solidworks, Microsoft Office
Laboratory & Instrumentation: Mammalian/bacterial cell culture, FPLC, ELISA, SDS-PAGE, analytical assays (BCA Protein, PicoGreen, Bradford protein), pipetting, HPLC, PCR thermocyclers, brightfield/fluorescent microscopy, solution/buffer preparation, BSL-2 cabinets, fluorescence protein readers, DOE

Thomas Minh Nguyen

Davis, CA

919-619-5766 | tmhnguyen@ucdavis.edu | https://linkedin.com/in/thomas-minh-nguyen

https://thomasmhnguyen.github.io

AWARDS

- UC Davis GSA Research Travel Award (2023)
- UC Davis GAANN Fellowship (2019)
- UC Davis TOPS Fellowship (2019)

PUBLICATIONS

Justin Maddox, **Thomas Nguyen**, … (2025). "Transport and Clogging of Fibers in Millifluidic Channels". *In Prep.*

Thomas Nguyen, Harishankar Manikantan (2024). "Cross-Streamline Migration and near-Wall Depletion of Elastic Fibers in Micro-Channel Flows". *Soft Matter* (DOI: 10.1039/D3SM01499A)

Thomas Nguyen, Harishankar Manikantan (2023). "Flow-induced buckling of elastic microfilaments with non-uniform bending stiffness". *Frontiers in Soft Matter* (DOI: 10.3389/frsfm.2022.977729)

Jaekwan Kim, **Thomas Nguyen**, … (2023). "Lysine Methyltransferase Kmt2d regulates Naive CD8+ T-cell activation-induced survival". Frontiers in Immunology (DOI: 10.3389/fimmu.2022.1095140)

Jian Lu, Guobing Chen, Arina Sorokina, **Thomas Nguyen**, … (2022). "Cytomegalovirus infection reduced CD70 expression, signaling and expansion of viral specific memory CD8+ T Cells in healthy human adults". *Immunity and Ageing*. (DOI: 10.1186/s12979-022-00307-7)

Xiaoping Sun, **Thomas Nguyen**, … (2022). "Longitudinal analysis reveals age-related changes in the T cell receptor repertoire of human T cell subsets". *Journal of Clinical Investigation* (DOI: 10.1172/JCI158122)

Jian Lu, Raheel Ahmad, **Thomas Nguyen**, … (2022). "Heterogeneity and transcriptome changes of human CD8+ T Cells across nine decades of life". *Nature Communications* (DOI: 10.1038/s41467-022-32869-x)

Annette Ko, Masashi Watanabe, **Thomas Nguyen**, … (2020). "TCR Repertoires of Thymic Conventional and Regulatory T Cells: identification and characterization of both unique and shared TCR sequences". *The Journal of Immunology* (DOI: 10.4049/jimmunol.1901006)

CONTRIBUTED CONFERENCE/RESEARCH PRESENTATIONS

Thomas Nguyen, Justin Maddox, … (Oct. 2024). "Transport and Clogging of Fibers in Millifluidic Channels". *American Institute of Chemical Engineers Annual Meeting*. San Diego, CA.

Thomas Nguyen, Harishankar Manikantan (Nov. 2023). "Signatures of cross-streamline migration of elastic fibers in microscale flows". *76th Annual Meeting of the APS Division of Fluid Dynamics*. Washington D.C.

Thomas Minh Nguyen

Davis, CA

919-619-5766 | tmhnguyen@ucdavis.edu | https://linkedin.com/in/thomas-minh-nguyen

https://thomasmhnguyen.github.io

Thomas Nguyen, Harishankar Manikantan (Oct. 2022). "Buckling and Transport of Heterogeneously Stiff Elastic Fibers in Microscale Flows". *American Institute of Chemical Engineers Annual Meeting.* Phoenix, AZ.

Thomas Nguyen, Harishankar Manikantan (Oct. 2021). "Structural Instability and Transport of Flexible Fibers with Non-Uniform Rigidity". *American Institute of Chemical Engineers Annual Meeting.* Boston, MA.

Thomas Nguyen, … (2019) "Longitudinal analysis of the Alpha/Beta TCR repertoire reveals distinct features of CD4+ and CD8+ T cells and their changes with age." National Institutes of Health Post-Bac Poster Day. Bethesda, MD.

Thomas Nguyen, … (2019) "Longitudinal analysis of the Alpha/Beta TCR repertoire reveals distinct features of CD4+ and CD8+ T cells and their changes with age." National Institute on Aging Post-Bac Poster Day. Bethesda, MD.

Thomas Nguyen (2019). "Longitudinal analysis of alpha-beta TCR Repertoire of Human CD4+ and CD8+ T-cells reveal distinct age-associated changes." Laboratory of Molecular Biology and Immunology-National Institute on Aging. Baltimore, MD.

Jian Lu, Raheel Ahmad, **Thomas Nguyen**, … (2019) "Single Cell RNA-Seq and Multi-Color Flow Cytometry analyses reveal fine composition of human CD8+ T cells." Cold Spring Harbor Laboratory Systems Immunology Conference. Cold Spring Harbor, NY.

Thomas Nguyen, … (2018). "TCR Sequences of mouse conventional and regulatory CD4+ T cells are similar in the periphery, but distinct in the thymus." National Institutes of Health Immunology Interest Group Workshop. Leesburg, VA.

Thomas Nguyen, … (2018). "TCR Sequences of mouse conventional and regulatory CD4+ T cells are similar in the periphery, but distinct in the thymus." National Institutes of Health Post-bac Poster day. Bethesda, MD.

Thomas Nguyen, … (2018). "TCR Sequences of mouse conventional and regulatory CD4+ T cells are similar in the periphery, but distinct in the thymus." National Institute on Aging Post-bac Poster day. Baltimore, MD.