Thomas Minh Nguyen

Davis, CA
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EDUCATION

University of California-Davis Davis, CA
Ph.D. in Chemical Engineering | GPA: 3.69/4.00 Sep. 2019 - Jun. 2025 (*expected*)
Research focus: Large-scale modeling, simulation, and prediction of fluid-structure interactions and related physical phenomena

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 - Present

- Developed code-base for **multi-scale computational fluid dynamics (CFD) simulations, multiphysics models, and data analysis** in a start-up setting.
- Developed a **physics-based deep learning model** on to model heat transfer and diffusion transport phenomena.
- Compiled **C-based code** with numerical linear algebra libraries to solve physics problems involving **PDEs**.
- Implemented **MPI** for parallel computing of C-based code, optimizing **multi-processor workloads** to accelerate PDE solvers.
- Leveraged expertise and published literature to refine CFD models, address project goals, and meet deadlines from collaborative experimental partners.
- ***Project:*** *Predicting particle clogging dynamics in microfluidic systems (**2024-Present**)*
    - Applied data-driven decision-making on **500+ CFD simulations and experimental data**, generating mechanisms that improve system performance by **at least 25%**.
- ***Project:*** *Optimization calculation times for multi-particle CFD simulations **(2024)***
    - Developed an **innovative algorithm** to optimize multi-particle simulations, achieving at least **100x decrease** in computation times.
- ***Project:*** *Predictive model for particle deformation in microfluidic systems (**2020-2022**)*
    - Developed a **predictive framework** to quantify particle deformation from **6000 CFD simulations**. Achieved **>75% accuracy** in predicting the correct deformation shapes.

Teaching Assistant Davis, CA
UC Davis Department of Chemical Engineering Jan. 2021 - Present

- Led technical labs and discussion sessions for **100+ students**, articulating experimental protocols, basic Python programming, and Python-based scientific computing.
- Improved students' grades on subsequent assignments by at least **25%** through mentoring and detailed responses to needs.

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

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

- Applied **bioinformatics** and **data science** methods to extract features and signals from **high-dimensional biological data**.
- Mentored junior researchers on automated workflows on **high-performance computing infrastructure**, increasing team productivity by **30%** and reducing data analysis time by **25%**.
- Authored technical documents for **5 peer-reviewed publications** and **7 presentations**.
- ***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**. Attained up to **89% accuracy** when compared to **scRNA-Seq datasets**.

Flexible Volume Manufacturing Intern Durham, NC

Biogen Jun. 2017 - Aug. 2017

- Collaborated with engineers and manufacturing associates on multiple projects, leveraging cGMP manufacturing knowledge to complete continuous process improvement projects.
- Translated technical needs from employees and other co-workers into action items and objectives while adhering to timeframes.
- Executed **3 animal cell culture fermentation studies** utilizing single-use bioreactors and other single-use technologies, following **SOP's** and documenting involvement and progress in **batch records**.
- Developed novel electronic system for tracking over **6 different** chemical reagents across **2 manufacturing suites**, surpassing **FDA cGMP (21 CFR Part 210)** compliance.
- Analyzed process data from **3 critical process parameters** to optimize chemical reagent preparation in single-use vessels.

Small Scale Manufacturing Intern Holly Springs, NC

Seqirus May. 2016 - Aug. 2016

- Identified production bottlenecks associated increased production to 12 batches/week of 5L MDCK cell culture for influenza vaccine production, leading to 50% decrease in employee efficiency.
- 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**.

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Biomanufacturing Intern Raleigh, NC

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

- Conducted hands-on **fluidic system** testing and troubleshooting, ensuring efficient pumping, flow control, and system integration in **AKTA-FPLC systems**.
- ***Project:*** *Optimization of influenza virus purification on protein chromatography columns*
    - Applied **Design of Experiments (DOE)** methods to optimize protein purification protocols of influenza virus. Determined process parameters that increased effluent purity by **40%**.

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, C, C++, MATLAB, R

Python Frameworks: NumPy, SciPy, PyTorch, Pandas, Scikit-learn, OpenCV

Scripting: Bash/Linux Shell, High-Performance Computing (HPC) Systems

Engineering/Data Analysis: Computational fluid dynamics (CFD), fluid-structure interactions (FSI), Multiphysics modeling and simulations, numerical methods (finite differences, finite elements), predictive modeling, time-series analysis, image processing, statistical analysis, machine learning, AI/deep learning

Data Engineering: ELT pipelines

Software, Applications, Tools: COMSOL, Ansys Fluent, Jupyter Notebooks, GitHub, Git, Spyder, RStudio, Anaconda/Miniconda, PyCharm, JMP, GraphPad Prism, AutoCAD, Solidworks

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

AWARDS

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

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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 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 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.

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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.