



## Justin Tam, Ph.D.

Scientist | Computer, Data & Security Sciences  
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### Professional Profile

Justin Tam, Ph.D., is a computer scientist with expertise in artificial intelligence and machine learning (AI/ML) systems, software development, and computational biology. He specializes in designing and deploying AI-driven software, from data collection and early-stage architecture through production deployment. He has experience building AI products in pharmaceutical and U.S. Department of Energy national laboratory environments. His technical expertise extends to many computing disciplines, including full-stack development, database engineering, high-performance computing (HPC), distributed systems, algorithm development, and scalable software architecture.

Dr. Tam has significant experience in evaluating, designing, and building AI/ML systems, spanning large language model (LLM) training, agentic AI tools, retrieval augmented generation (RAG), software architecture, algorithm assessment, AI interpretability and explainability (XAI), and large-scale data engineering pipelines. His work is particularly relevant to clients developing or evaluating AI and software systems in research-driven, regulated, or high-assurance environments where reliability, interpretability, and audibility are critical.

Prior to joining Exponent, Dr. Tam developed AI-driven systems for scientific discovery and high-assurance government research applications. In the biotech industry, he trained language models on mRNA sequence data to support drug design and vaccine research. In a U.S. Department of Energy national laboratory setting, he led agentic AI development for automating large-scale analysis and visualization workflows, working under strict guidelines for code quality, documentation, and reproducibility.

Dr. Tam received his Ph.D. from Lehigh University, where he published several papers on deep learning applications in bioinformatics. He developed neural network methods (CNNs, GNNs) using TensorFlow and PyTorch for 3D molecular modeling and structural analysis of protein interactions. He has led natural language processing (NLP) efforts for large-scale data collection from scientific paper archives and published frameworks for maintainable and scalable software systems. He is particularly passionate about addressing the communication and translation challenges that arise when computational experts collaborate with scientists, engineers, executives, legal teams, and other domain specialists.

As a software developer, Dr. Tam has broad experience across software review, source code auditing, agentic AI tooling (LangChain, LangGraph, MCP), database systems, and scientific computing. He has developed software using Python, C++, Java, JavaScript, HTML, and SQL.

Dr. Tam is a strong advocate for AI education and responsible AI adoption. He has served as an adjunct professor in mathematics and as a teaching assistant in algorithms and software engineering. He frequently gives invited talks on AI best practices and practical approaches to responsible AI implementation.

## Academic Credentials & Professional Honors

Ph.D., Computer Science, Lehigh University, 2026

B.A., Mathematics, Skidmore College, 2019

## Academic Appointments

Teaching Assistant, Computer Science, Lehigh University, 2020-2025

Adjunct Professor, Mathematics, New York City College of Technology, 2019-2020

## Prior Experience

AI/ML Graduate Researcher, Los Alamos National Laboratory, 2025-2026

Bioinformatics Research Co-op, Moderna, 2024

## Professional Affiliations

IEEE Member

ACM Member

## Publications

Tam JZ, Grosset P, Banesh D, Ramachandra N, Turton TL, Ahrens J. [InferA: a smart assistant for cosmological ensemble data](#). Workshops of the International Conference for High Performance Computing, Networking, Storage and Analysis (SC Workshops) 2025.

Tam JZ, Liu Y, Jain DS, Armstrong G, Chen BY. [Automatic explanation of protein-protein binding mechanism: a preliminary study](#). Computational Structural Bioinformatics Workshop 2024.

Tam JZ, Chua A, Gallagher A, Omene D, Okun D, DiFranzo D, Chen BY. [A containerization framework for bioinformatics software to advance scalability, portability, and maintainability](#). ACM International Conference on Bioinformatics, Computational Biology and Health Informatics (ACMBCB) 2023.

Liu Y, Armstrong G, Tam JZ, Chen BY. [MechPPI: binding mechanism-based machine learning tool for predicting protein-protein binding affinity changes upon mutations](#). bioRxiv 2023.

Tam JZ, Kong Z, Ahmed O, He L, Chen BY. [HBcompare: Classifying ligand binding preferences with hydrogen bond topology](#). Biomolecules, MDPI 2022.

Tam JZ, Palumbo T, Miwa JM, Chen BY. [Analysis of protein-protein interactions for intermolecular bond prediction](#). Molecules, MDPI 2022.

Tam JZ, Palumbo T, Miwa JM, Chen BY. [DiffBond: a method for predicting intermolecular bond formation](#). IEEE International Conference of Bioinformatics and Biomedicine (BIBM) 2021.

## Presentations

Tam JZ. AI in teaching and learning: best practices for AI use. Invited talk, New York City College of Technology, New York, NY, 2026.

Tam JZ. Practical AI tools in teaching, learning and research. Invited talk, Medgar Evers College, Brooklyn, NY, 2026.

Tam JZ. InferA: a smart assistant for cosmological ensemble data. AI4S Workshop at SC'25, St. Louis, MO, 2025.

Tam JZ. Agentic AI workflows for cosmology. Poster talk at LANL Poster Symposium, 2025.

Tam JZ, Liu Y. Automatic explanation of protein-protein binding mechanism: a preliminary study. IEEE CSBW, Boston, MA, 2024.

Tam JZ. A containerization framework for bioinformatics software to advance scalability, portability, and maintainability. IEEE CSBW at ACMBCB 2024, Houston, TX, 2023.

Tam JZ, Palumbo T, Miwa JM, Chen BY. DiffBond: a method for predicting intermolecular bond formation. IEEE CSBW at BIBM 2021.

## Peer Reviews

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