# TEJAS MAHAJAN

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## EDUCATION

**University of Central Florida** — Orlando, FL (2025 – 2030) *Ph.D. in Computer Science* | Computational Biology Lab (Advisor: Dr. Wei Zhang)

- Research focus: Single-cell multi-omics generative modeling, spatial transcriptomics, gene regulatory network inference, and AI security.

**Waseda University** — Tokyo, Japan (2021 – 2025) *B.E. in Computer Science & Communications Engineering*

## ACADEMIC & RESEARCH EXPERIENCE

**Graduate Research Assistant — Computational Biology Lab, UCF** (2025 – Present)

- Developed **ChronoGRN**, a delay-aware, enhancer-gated Neural ODE framework for inferring time-varying gene regulatory networks from paired single-cell multiome trajectories.
- Built **Clinical Trial Matchmaking**, a two-stage retrieval and zero-shot LLM reasoning pipeline for automated patient-to-trial eligibility matching on clinical trials corpora.
- Conducted comparative differential expression benchmarking (PyDESeq2 vs. InMoose edgeR) on bulk RNA-seq datasets in human asthma airway smooth muscle.

**Graduate Teaching Grader — Department of Computer Science, UCF** (Aug 2026 – Present)

- Assisted instruction, automated grading infrastructure, and technical evaluation for undergraduate computer science coursework.

## SELECTED PUBLICATIONS & MANUSCRIPTS

- **ChronoGRN:** Delay-Aware, Enhancer-Gated Neural ODEs for Time-Varying Gene Regulatory Network Inference from Single-Cell Multiome Trajectories (2026).
- **FairDRAM:** QoS-Aware Memory Scheduling for CPU–AI Co-Execution (2026).
- **SyntheticShield:** Auditing Memorization and Membership Leakage in Synthetic Data Generators (2026).
- **ModelCardSec:** Automated Privacy and Security Risk Profiling for Machine Learning Models (2026).
- **PromptLeakDetector:** Runtime Detection of System Prompt and Context Leakage in LLM Applications (2026).
- **RAGGuard:** A Context-Aware Privacy Firewall for Retrieval-Augmented Generation (2026).
- **Comparative Differential Expression Analysis:** PyDESeq2 vs. InMoose edgeR for bulk RNA-seq in asthma airway smooth muscle (2025).

## SELECTED ENGINEERING & QUANTITATIVE PROJECTS

- **Tejas Trading & TradeSim** (github.com/tejas-ml/tejas-trading, TradeSim): Prediction-market trading platform, real-time limit orderbook simulator, and Black–Scholes options pricing & Greeks engine.
- **AI Security Suite** (SyntheticShield, RAGGuard, PromptLeakDetector): Privacy firewalls, membership-inference auditing, and runtime prompt-leakage detection for LLM pipelines.
- **Healthcare & Clinical ML** (trial-matchmaking, patient-monitoring, health-fraud): Clinical trial eligibility retrieval, real-time patient vital-sign anomaly detection, and healthcare claims fraud detection.
- **Interactive Quantitative & Scientific Web Tools** (finance-planner, orderbook, adder-visualization): Client-side financial Monte Carlo planner, matching engine visualization, and digital logic circuit simulators.

## TECHNICAL SKILLS

- **Languages:** C++, Python, Rust, TypeScript, JavaScript, R, SQL, Kotlin, Java, C, HTML/CSS, LaTeX
- **Machine Learning & Bio-AI:** PyTorch, Scanpy, Muon, scvi-tools, Flow Matching, Diffusion, Contrastive Learning, GNNs, Neural ODEs, XGBoost, RAG / LLMs
- **Systems, Quant & Web:** Linux, Slurm/HPC, Docker, Git, Next.js, React, Node.js, PostgreSQL, MongoDB, Supabase, AWS, Black–Scholes & Limit Order Book Modeling