Rany Stephan

ranycs@stanford.edu | (650) 509-9057 | linkedin.com/in/ranystephan | github.com/ranystephan

EDUCATION

Stanford University — Expected June 2026
M.S. in Mathematical and Computational Finance — *Stanford, CA*
- Coursework: Convex Optimization, Numerical Linear Algebra, Stochastic Differential Equations, Beyond Worst-Case Analysis, Mathematical Finance, Advanced Probability and Statistics, Parallel Computing, Deep Reinforcement Learning

American University of Beirut — June 2024
B.B.A. Finance & B.Sc. Computer Science (Dual Degree), Minor in Applied Mathematics — *Beirut, Lebanon*
- **Honors:** Dean's Honors List | **Major GPA: 4.00/4.00**
- **Thesis:** Leveraged NLP and Generative Models for Financial Analysis in MENA, addressing Data Scarcity.

RESEARCH EXPERIENCE

Graduate Researcher, Convex Optimization — Sept 2024 – Present
Advisor: Prof. Stephen Boyd — *Stanford, CA*
- Develop portfolio liquidation strategies using **Model Predictive Control (MPC)** and **convex optimization** to minimize implementation shortfall while tracking a benchmark.
- Engineer a high-fidelity backtesting framework in **Python** using **CVXPY**, **Pandas**, and **NumPy** to simulate multi-period portfolio transitions under transaction costs and market impact models.
- Implement efficient numerical methods, including sparse **Cholesky factorization**, to accelerate optimization solver performance within the simulation environment.

Graduate Researcher, Fixed Income Modeling — Dec 2024 – Present
Advisor: Prof. Darrell Duffie — *Stanford, CA*
- Model off-the-run bond inventories and dealer behavior by formulating and solving **Hamilton-Jacobi-Bellman (HJB) equations** to derive optimal trading policies.
- Develop dynamic market equilibrium experiments in **Python** and **Julia**, providing actionable insights for bond market structure and liquidity analysis.

Graduate Researcher, AI and ML in Computational Pathology — Jan 2025 – Present
Advisor: Dr. Andrew Gentles — *Stanford, CA*
- Lead development of HExIF, an end-to-end **PyTorch** pipeline that generates virtual multiplex immunofluorescence images from H&E stains, reducing analysis time and cost.
- Architect and train conditional GANs (**pix2pix**) and multi-task **U-Net** models to synthesize fluorescence intensity maps and cell segmentation masks from histopathology inputs.

Research Assistant, Machine Learning, NLP & Time-Series Analysis — Sept 2022 – Aug 2024
American University of Beirut — *Beirut, Lebanon*
- **Co-author** in "Opportunities for circular economy in waste reuse: Insights from social media data mining", journal of Resources, Conservation & Recycling. Applying transfer learning on 10,000+ scraped articles.
- Engineered regression models to quantify equity price delay and conducted a 20-year sentiment-based time-series analysis of 1,200+ financial reports, identifying signals of market inefficiency.
- Fine-tuned a MobileNetV2 image classifier in **TensorFlow**, improving accuracy by **15%** on specialized datasets for a co-authored publication on waste reuse analysis.

PROJECTS & COMPETITIONS

Winner, Murex Best Development Project Award ($3,000) — *June 2023*
- Solely architected and developed **NeuralFin**, a full-stack financial analysis platform using Python (Django, scikit-learn) for predictive stock modeling and sentiment analysis.

University Representative, Refinitiv Portfolio Management Competition — *Oct 2023*
- Implemented an optimized asset allocation model in **Python**, using **Markowitz's Efficient Frontier** and **Conditional Value at Risk (CVaR)** to maximize risk-adjusted returns.
- Achieved top-quartile performance managing a $1M mock portfolio against international university teams.

PROFESSIONAL EXPERIENCE

Venture Capital Intern — June – Aug 2022
Insure and Match Ventures — *Beirut, Lebanon*
- Automated KPI reporting for 15+ portfolio companies by building PowerBI dashboards with PowerQuery.
- Increased team's deal sourcing efficiency by **30%** by creating a relational database and statistical models to score and rank over 1,000 inbound leads.

TECHNICAL SKILLS

Languages: Python, Julia, C++, SQL, Java, JavaScript, C
Libraries: PyTorch, CVXPY, Pandas, NumPy, Scikit-learn, TensorFlow, Matplotlib
Developer Tools: CUDA, Git, Docker, Next.js, React, Django, Node.js, PowerBI, LaTeX
Languages (Spoken): English (Native), French (Native), Arabic (Native), Italian (Working Proficiency)