

# ANSH HEMANG DANI

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## EDUCATION

### The University of Chicago

Chicago, IL

#### Master of Science in Financial Mathematics (Maroon Merit Scholarship)

Expected December 2027

- Courses: Probability & Stochastic Processes, Options, Portfolio & Risk Management, Systematic Trading Technologies

### Arizona State University

Tempe, AZ

#### Bachelor of Science in Computer Science; Bachelor of Science in Mathematics (GPA: 4.00, Summa Cum Laude) May 2026

- Courses: Bayesian Statistics, Graduate Time Series, Machine Learning, Deep Learning, Real/Numerical Analysis, Algorithms

Honors: Moeur Award; Thesis: Bayesian Approaches to Sequential Decision-Making in Uncertain Environments

## EXPERIENCE

### WH Trading

Chicago, IL

#### Quantitative Research – University of Chicago Project Lab

October 2026 – Present

- Building realized-volatility forecasts across futures horizons and benchmarking accuracy against implied volatility
- Evaluating regime-aware hedging in momentum and mean-reverting futures vs. fixed thresholds on P&L, risk and turnover

### Endless Moments LLC

Tempe, AZ

#### Quantitative Modeling Intern (AI/ML)

September 2025 – May 2026

- Forecasted revenue and expenses using ARIMA/LSTM, reducing out-of-sample RMSE ~15% versus baseline forecasts
- Validated forecasts with 2-3 years of walk-forward tests and drift diagnostics of feature stability and signal decay by regime

### Morrison School of Agribusiness, W.P. Carey School of Business

Tempe, AZ

#### Quantitative Research Intern (Econometrics, USDA Grant Funded)

June 2025 – September 2025

- Parallelized Python econometric estimation on 100M+ forest-visitation records, cutting runtime ~70% (~10 h to ~3 h)
- Built Jacobian-corrected Box-Cox likelihoods in Python and Stata/Mata to compare regressions with different dependent variables on a common scale, validated by reproducing OLS exactly at  $\lambda = 1$

## RESEARCH & COMPETITIONS

### CME Energy Futures Microstructure ([Working Paper, SSRN](#); 440M+ Order Records)

August 2026 – Present

- Across 60 EIA releases, near-mid depth stays depleted for the equivalent of 34s (crude) / 48s (gas) per 5 min beyond matched days; before releases, missing new orders (crude) and extra fills (gas) offset a lower cancel share, contrary to hypothesis
- Benchmarked backtester queue models against 57.7M resting orders rebuilt with my C++20/pybind11 library ([mbo-queue](#), on PyPI): fill-timing error of 0.3-1.1s (crude) and 0.7-2.0s (gas); a post-EIA gas gain was mostly a shift in which orders fill
- Found crude futures quotes lead Micro WTI below 1ms on all 66 days studied (24% vs. 12% net same-direction follow), and Micro WTI resting orders filled during an adverse crude move lose ~0.6 ticks more per fill at 1-10s

### C++ Limit Order Book & Market-Making Simulator

May 2026 – October 2026

- Built a price-time-priority C++ matching engine (partial fills, cancel/replace, self-trade prevention; 125 ns p50) that reproduces Liquibook's fills exactly at 2.4-2.8x its throughput on a synthetic deep-queue benchmark (replicated)
- Showed why simulated market makers stop getting filled: under ITCH-calibrated QQQ flow, Avellaneda-Stoikov fills collapse from ~60-74% to < 2% because executions are sparse; inventory-reducing fills carry 87-95% of the extra adverse selection

### Optiver × UChicago Explaining Markets: 2nd Globally

August – September 2026

- Modeled 517 earnings reactions using quarter-over-quarter changes in LLM-extracted features; added  $\Delta R^2 +0.150$  beyond earnings surprise (95% CI 0.10-0.20), 27% above the top LLM baseline (0.118)
- Enforced out-of-sample replication before model changes, rejecting 2 fixes and cutting another estimated gain ~60%; ran an LLM extraction-and-scoring pipeline across 584/584 live events with zero errors (~1s median latency)

### SPY Volatility Surface Research

April – June 2026

- Engineered a tested SPY options engine (Greeks, IV inversion, static-arbitrage checks) calibrated on 273 liquid OTM quotes; found and fixed an expiry-clock error (UTC midnight vs 16:00 NY close), cutting the shortest expiry's SABR RMSE from 0.364 to 0.039
- Demonstrated SABR beat Heston on every expiry (median RMSE 0.0060 IV); ruled out a Heston pricer bug via synthetic recovery

### IMC Prosperity 4: Top 1.4% of 18,800+ (#256 Overall, #194 Algorithmic)

April – May 2026

- Market-made products using Ornstein-Uhlenbeck fair values, skewing quotes for book imbalance to limit adverse selection
- Isolated pricing edge in near-the-money strikes of a 10-strike call chain; paused takes on pre-move spread compression

## SKILLS & INTERESTS

**Programming:** Python, C++ (C++20), SQL, R, MATLAB, Stata/Mata, Bash, LaTeX

**Libraries & Tools:** NumPy, pandas, Polars, SciPy, statsmodels, scikit-learn, PyTorch, XGBoost, pybind11, Git, Linux, CMake

**Interests:** Poker, Chess, Prediction Markets, Game Theory, Soccer & Sports Analytics