

# Juan Belza Garcia

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## EDUCATION

### University of California, Berkeley

Bachelor of Arts in Computer Science and Mathematics

Poker@Berkeley Board, Berkeley International Collegiate Programming Team

Berkeley Deep Learning Reading Group; Mechanistic Interpretability Reading Group; Berkeley Probability Seminar

Berkeley, CA

May 2028

## HONORS

IMO TST · USAMO Qualifier · AIME 1st Place in Taiwan · AMC Distinction

Feb. 2023

USACO Platinum · Codeforces 2000+

Dec. 2023

Atlas Fellow (\$10k scholarship; 0.7% acceptance; \$1M fund access)

Jun. 2023

European Summer Program on Rationality (hosted at Oxford University; <2% acceptance)

Aug. 2023

Purple Comet Math Meet · 2× 1st Place (Taiwan) · WMC Winner

2022–23

## EXPERIENCE

### Incoming Quantitative Researcher

Summer 2026

Xantium Group

### IMC Prosperity Challenge

Apr. 2025

Global Trading Competition

- Built multi-product trading bots using Black–Scholes, Kalman forecasting, VWAP baskets, and spread mean-reversion across 12+ instruments. Tuned execution, inventory limits, and adverse-selection filters; top-10 global placements.

### Poker/Math Teaching

Aug. 2023 – Present

Contract / AMC Academy / TAS Math Team

- Coaching high-stakes regs in HU SNG/HU cash + ring via custom ante sims, squid sims, and nodelocking.
- AMC Academy instructor (AMC/AIME + USACO); former TAS Math Team captain: weekly lectures, contests/POTWs, and organized WMC /COMAP/HMMT contests.

### Software Engineer

Jul. 2023 – Aug. 2023

Bulgarian National Bank

Sofia, Bulgaria

- Built Python pipeline for real-time housing-market analytics, deployed as an internal monitoring engine.
- Applied multivariate time-series models and spatial econometrics for affordability indices and price clustering.

### Mathematics Researcher

Jul. 2023 – Aug. 2023

Bulgarian Academy of Sciences

Varna, Bulgaria

- Studied Football Pool Problem; sphere covering/packing methods in  $\alpha$ -ary ( $q$ -ary) Hamming spaces (research note).

## PROJECTS

### Trading Bot (Polymarket / Kalshi)

Present

- Built and deployed a live trading system that scrapes sportsbook odds and cross-market prices to compute fair price, execute hedged arbitrage, and learn position sizing via online RL/bandits. Bot is deployed and improving.

### Machine Learning (Independent Research / Writing) site

2025 – 2026

- Implemented a GPT-2-style transformer LM in PyTorch with causal MHA and top-k/temperature sampling.
- Trained VAEs and DCGANs on CelebA-64; implemented reparameterization and transposed-conv decoders.
- Derived diffusion objectives (ELBO; noise prediction vs score matching) and implemented train/sampling loops.
- Built an autodiff engine (graph + topo backprop + unbroadcasting); validated via an MNIST MLP.

### Predictive Modeling for Lung-Cancer Progression

2024

National Taiwan University

Taipei, Taiwan

- Under PhD student Moritz Sontheimer. 70% accuracy predicting progression using ensemble ML techniques.

### Fluid Simulation (2D Incompressible Navier–Stokes)

2025

Independent Project

- Built a stable 2D fluid solver (semi-Lagrangian advection + pressure projection) with real-time visualization.

## TECHNICAL SKILLS

**Languages:** Python, C++, Java

**ML/Scientific:** PyTorch, NumPy, SciPy, Pandas, Matplotlib, statsmodels, scikit-learn

**Tooling:** Weights & Biases (W&B), Jupyter, Git, Linux

**Quantitative:** Time Series, Statistical Modeling, Stochastic Processes, Applied Econometrics