Mihail Dimitrov

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Education

University of California, Berkeley **December 2026**
B.S. Electrical Engineering & Computer Sciences, B.A. Data Science, B.A. Economics Berkeley, CA

- **Coursework:** Machine Learning, Deep Learning, Computer Vision, Convex Optimization, Time Series Analysis, Probability & Stochastic Processes, Data Science, Data Structures & Algorithms, Game Theory, Discrete Mathematics, Multivariable Calculus, Signal Processing, Quantitative Micro/Macroeconomics, Econometrics, Mathematical & Behavioral Finance

Experience

Texas Title Insurance **Jun 2025 – Present**
Software Engineer Contractor (NLP) Dallas, TX (Remote)

- Develop a B2B SaaS platform for automation and QC of legal property documentation for 5+ regional title insurance firms, projected to reduce examiner workload by 33% and currently piloted by 20+ examiners at Texas Title
- Automate legal title summary generation through AI-powered field extraction to fill in key fields using structured outputs from OCR and document parsing models, reducing manual examiner effort by over 90%
- Deployed a document processing pipeline using a fine-tuned OCR model and rule-based Regex parsing, and implemented a layout-aware preprocessing pipeline to extract structured data from property files and flag discrepancies in manual documents

Berkeley Cognition and Action Lab **Feb 2025 – May 2025**
Machine Learning Researcher Berkeley, CA

- Trained GRU neural networks (MSE 0.007; R^2 99.7) to model motor adaptation using a custom Gym-based environment built with MotorNet, simulating arm movement adjustments across normal, rotated, and mirror-reversed visual feedback
- Prototyped a unified model by merging trained GRU layers, achieving >90% trajectory accuracy across all feedback modes
- Generated comparative adaptation curves and latent-space visualizations, contributing core model analysis to an upcoming motor control paper with Dr. Richard Ivry and Tianhe Wang

Tail Sports Analytics **Apr 2024 – Apr 2025**
Founding Engineer Seattle, WA (Hybrid)

- Spearheaded a Flutter + Firebase app for live odds tracking across 8 sportsbooks with social strategy sharing and stat charts
- Built a TensorFlow model combining XGBoost and neural nets with 23 engineered features to generate betting recommendations, achieving 64% accuracy on NFL over/under bets with 4.2% ROI over 400+ games
- Backtested 10,000+ betting scenarios using Monte Carlo methods with bankroll management algorithms and Kelly Criterion position sizing, reducing strategy overfitting by 24% and identifying optimal bet selection thresholds

Expat Capital **May 2023 – Aug 2023**
Quantitative Research Intern Sofia, Bulgaria

- Deployed an LSTM forecasting model to predict ETF performance for portfolio optimization, achieving 5% annualized excess returns through asset allocation; currently used by 6+ analysts at Expat for investment strategy decisions
- Engineered an automated pipeline to scrape, parse, and extract data from 1,000+ semi-structured European financial statements using Regex and statistical line-item mapping, applying log transformations and low-rank approximations before creating and loading 50+ IFRS-aligned features into MySQL, cutting model training time by 38%

Projects

Transformer-Based News Digest System **May 2025 – Present**

- Develop a Flutter mobile app with Firebase/FastAPI backend featuring AI-powered personalized news summarization and podcast-style TTS audio generation, integrated with real-time conversational interfaces for live human-machine interaction
- Created a Cron pipeline to scrape 10K+ daily news headlines from 38 media outlets across 10 broad content categories, stored in Firestore to support semantic retrieval and summarization with an average ETL time of 43 seconds per outlet
- Deployed end-to-end podcast generation system on AWS EC2 leveraging SBERT+FAISS semantic search and fine-tuned BART-based RAG pipeline, achieving 92% Precision@3 for automated script generation from a curated article corpus

Volatility Regime Detection for VIX Term Structure Trading **Jan 2025 – Apr 2025**

- Created a proprietary volatility regime detection system using a Hidden Markov Model, identifying distinct market conditions (low/medium/high volatility periods) with 82% accuracy by analyzing VIX levels, term structure patterns, and S&P 500 volatility
- Developed, backtested and implemented a systematic regime-aware trading strategy that outperformed benchmarks, generating 12% annualized returns with 1.4 Sharpe ratio and only 12% maximum drawdown over 5 years (including major volatility events in 2020), and beating buy-and-hold VXX by 210 basis points annually

Skills

- **Machine Learning:** PyTorch, TensorFlow, OpenCV, scikit-learn, pandas, HuggingFace, Weights & Biases, Prompt Engineering
- **Technical:** Python, C#, Swift, C++, C, PostgreSQL, MySQL, AWS (Solutions Architect), Firebase, Cron, Linux, Git, Docker
- **Languages:** English, Bulgarian, Serbian, French *(intermediate)*