PATRICK BEAL

jpatrickbeal@gmail.com | (385) 335-7441 | linkedin.com/in/jpatrickbeal | jpatrickb.github.io

Early-career **data scientist and economist** with strengths in optimization, machine learning, and statistical modeling. Experienced in developing pipelines that automate data ingestion and analysis (Python, SQL, Bayesian methods), reducing processes from weeks to minutes. Recognized for combining technical rigor with clear communication to drive research and business outcomes.

EDUCATION

Applied and Computational Mathematics (ACME) and **Economics, BS** **Apr 2026**
Brigham Young University

- GPA: 3.92 | Wheatley Scholar (2024 Cohort) | Dean's (4x)
- Coursework: Optimization, Algorithms, Machine Learning, PDEs/ODEs & Optimal Control, Econometrics, Software Development

EXPERIENCE

AI Consultant — *TechForce Advisors (Remote)* **August 2025 – Present**

- Advise clients on AI adoption and workflow automation, joining sales and discovery calls to assess business needs
- Conduct market research on emerging AI tools and recommend scalable solutions for scheduling, engagement, and CRM integration
- Designed a custom chatbot for an escape room franchise (FAQ + scheduling) and built social media automations in GHL CRM for a gym, ensuring consistent posting and brand voice as the sole technical team member

GTM Strategy & AI Intern —*Winning by Design, Provo, UT* **May 2025 – September 2025**

- Engineered a full-stack application that automated the Go-To-Market Diagnostic, standardizing CRM, finance, and customer success data into 20+ analyses (Python, Flask, SQL, Google APIs)
- Collaborated with a 3-person team and presented results to executives, reducing diagnostic turnaround from 6–8 weeks to 5–15 minutes
- Designed and deployed an LLM-based "Deep Dive" pipeline to analyze client call transcripts, scaling review capacity from ~20 calls over several weeks to unlimited calls in <30 minutes
- Automated slide-deck generation and delivered insights through a Slack interface, enabling consultants to advise clients with consistent, data-driven outputs

Research Assistant — *Office of the President, BYU* **August 2024 – Present**

- Research and author reports for President Reese on student development and related topics, synthesizing scholarship and literature into actionable insights to inform university strategy
- Collaborate with 6 research assistants and present findings in monthly meetings with BYU's president and leadership team, strengthening research through peer review and executive feedback

Research Assistant — *Department of Mathematics, BYU* **December 2023 – October 2024**

- Design and evaluate algorithms for biomarker detection in photoplethysmogram (PPG) signals, including Bayesian modeling, peak detection, signal quality metrics, mixture-of-experts ensembles, and dicrotic notch detection, with implementations in Python and integration into the lab's proprietary package
- Conduct experiments and comparative analyses in Jupyter notebooks, apply Bayesian methods to improve signal reliability, and document research workflows to support team reproducibility and onboarding

Opera Accompanist — *School of Music, BYU* **May 2025 – Present**

- Prepare and perform operatic repertoire at a professional level, coordinating closely with conductors and vocalists to achieve seamless ensemble performance in rehearsals and productions
- Support vocalists by balancing dynamics and timing, highlighting transferable strengths in attentive listening, precision, and team collaboration within high-stakes environments

Ballet Accompanist — *Department of Dance, BYU* **August 2024 – Present**

- Perform live accompaniment for 2-6 weekly ballet classes, including BYU's two premier company groups, by preparing, improvising, and sight-reading music across 8+ styles to support technique and choreography
- Adapt in real time to professor direction and dancer pacing, demonstrating strong situational awareness, rapid problem solving, and collaborative execution under pressure

Additional Experience & Leadership

- **Mathematics Grader (Math 290),** BYU (*Aug – Dec 2023*): Graded and guided 20 students on proofs in logic and discrete math
- **Volunteer Representative,** The Church of Jesus Christ of Latter-day Saints, Rochester, NY (*Aug 2021 – Aug 2023*): Developed fleet-management automations (Google Apps Script) for 100 vehicles
- **Research Assistant,** BYU Whitehead Lab (*Apr – Aug 2021*): Documented Bayesian statistical sampling tests for geologic computing software (Python)
- **Brass Salesperson / Software Developer,** Summerhays Music Center (*2018 – 2021*): Automated payment entry with PyWinAuto, cutting entry time by 85%
- **Music Leadership:** Principal/Lead Trombonist, BYU Symphony Orchestra, Lyceum Philharmonic, and Jazz Ensemble — led section rehearsals, mentored peers, and ensured high-level performance across orchestral and jazz repertoires

PROJECTS

Football to Admissions – 1st Place, BYU Statistics Department Case Study Competition (2025)

- Built pipelines (Python, pandas, scikit-learn, XGBoost) linking NCAA football records with College Scorecard admissions data to test the "Flutie effect"
- Implemented regression models, clustering, and engineered features (lagged win rates, tournament runs) to evaluate correlations between athletic success and application volumes
- Delivered interactive visualizations and a project site, earning 1st place out of 4 teams and presenting findings to faculty judges

Moonlander Optimal Control (2025) — Modeled trajectories for fuel-efficient lunar landing

- Modeled trajectories for fuel-efficient lunar landing, implementing and comparing strategies in Python using convex optimization and ODE modeling
- Evaluated solver performance and fuel trade-offs under different constraints, providing insights into optimal trajectory design
- Produced reproducible codebase and technical report to document design trade-offs

Housing Market Analysis (2025) — Examined affordability and pricing trends across regions

- Conducted exploratory data analysis on national housing datasets, cleaning and transforming data into reproducible notebooks (Python, pandas, matplotlib)
- Analyzed affordability trends and demographic correlations, visualizing drivers of regional market variation
- Presented findings in a structured report with clear visuals to guide interpretation

SKILLS

- **Data & Statistics**: Python (NumPy, pandas, SciPy), Stata, Bayesian Modeling, Machine Learning
- **Development**: C++, Java, SQL, Git, UNIX
- **Mathematics & Optimization**: Convex/Dynamic Optimization, Linear Algebra, PDEs/ODEs
- **Language:** Proficient in American Sign Language (ASL)