

Dr. Jimmy Risk

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PROFESSIONAL SUMMARY

Senior machine learning engineer (PhD Applied Statistics & Probability) focused on decision-making under uncertainty and statistical/probabilistic modelling. Translate Gaussian Processes, Bayesian optimization, and classical ML into **production-grade** MLOps pipelines (PyTorch, MLFlow, Docker, Kubernetes). Eight years mentoring MS theses and REU teams; emphasize mathematical fundamentals and enforce code standards and reproducibility. Track record: **winner, 2021 Society of Actuaries mortality-prediction contest**; PI on **\$131K** subaward; publications in **sports analytics**, network theory, quantitative finance (optimization, Monte Carlo).

MLOPS PROJECTS

RPS Quest (MLOps Proof of Concept) [\[github link\]](#) [\[academic blog\]](#)

October 2025

- Developed and built Kubernetes-native MLOps platform serving 12 production aliases across neural networks, XGBoost, logistic regression.
- Dockers and CronJobs for orchestrating training and implementation; training with temporal aware and game-stratified cross-validation
- Automated promotion and A/B testing via live win rates and accuracies backed with formal hypothesis testing; Grafana dashboards for stakeholders

WORK EXPERIENCE

Associate Professor & Research Advisor & Lecturer, Cal Poly Pomona

Sept 2017 - Present

Example Publications

- *European Football Player Valuation*: network centrality + continuous-time valuation linking soccer passing matrices, building novel models in network theory and player valuation; case studies with sports real match data and pricing of financial derivatives.
- *Expressive Mortality Models via GP kernels*: genetic-programming search over covariance kernels; APC-aware covariance learning; PyTorch implementation.
- *SOA 2021 ILEC Mortality Prediction Contest*: multi-output GP + GLM residual modeling on 33.8M rows; winning approach write-up.
- *Sequential Design & Spatial Modeling for Portfolio Tail Risk*: Bayesian optimization for enterprise risk management (VaR/TVaR) under nested Monte Carlo.
- *GP Models for Mortality Rates & Improvement Factors*: hierarchical GP smoothing and uncertainty quantification for age-year surfaces.

Advised Theses (14 M.S. students over 7 years; 4-student REU teams)

- Engineered spatio-temporal support vector machine (SVM) kernels and scalable variational Gaussian Process (GP) models (ocean-wave heights, image & text data including features extracted from LLMs).
- ResNet feature extraction for SVM classifiers. Utilized LSTM in learning policies in reinforcement learning tasks.
- Tuning GPs for Bayesian optimization problems and high-dimensional visualization.

Grant-Funded Projects

- **Principal Investigator**, *Development of Educational Pathways for Data Science* (subaward: \$131K from CA Education Learning Lab to UCSB).
 - Coordinated with eight other campuses to expand data science educational pipelines from community colleges to four-year universities.
 - Organized and hosted the consortium's first Datathon (~50 attendees, ~6 hours), leading event logistics, curriculum design, and hands-on data analysis workshops. Covers ETL workflow, visualization, end products

Teaching

- Focus on upper-division and graduate level data science, machine learning, and probability & statistics courses
- Repeatedly taught Statistical Consulting M.S. course: lead groups of M.S. students on several projects involving real world data and clients: ETL workflow and full ML pipelines, from data cleaning to producing high quality visuals, proper train-test-validation procedures, model selection, hypothesis testing
- Applications of advanced DS and ML tools (using R) to real world datasets: supervised/unsupervised methods, regularization, boosting, random forests

Statistics Consulting Center at California Polytechnic University, Pomona

Mar 2019 – Oct 2019

- Designed predictive models for graduation rates with Cox proportional hazard frameworks to model time to graduation.

EDUCATION

- **PhD in Applied Statistics & Probability** (*Emphasis in Mathematical Finance*), University of California, Santa Barbara June 2017
Dissertation: Gaussian Processes for Actuarial Modeling and Pricing
- **M.S. in Statistics & Probability**, Michigan State University May 2013
- **B.S. in Mathematics (Actuarial Specialization)**, Michigan State University Aug 2010

RELEVANT PUBLICATIONS WITH COMPANION CODE

- **Gaussian Process Models for Quantitative Finance** (2025). Springer. [\[book link\]](#) [\[companion code\]](#)
- **European Football Player Valuation: Integrating Financial Models and Network Theory** (2025). [\[preprint link\]](#) [\[companion code\]](#)
- **Gaussian Process Models for Mortality Rates and Improvement Factors** (2018). [\[preprint link\]](#) [\[companion code\]](#)

CORE TECHNICAL SKILLS

- **Programming & Infra**: Python (PyTorch/CUDA, GPyTorch, scikit-learn), R, SQL, Jupyter/R Markdown, Kubernetes, MLFlow, AWS, Docker, Git
- **Methods**: Gaussian Processes, Bayesian optimization, regression/classification (regularized), SVM, representation learning (ResNet and LLM features), sequence models (LSTM), clustering/PCA/SVD, time series ((S)ARIMA/GARCH), time-to-event modelling (Cox PH, multistate Markov models), feature engineering
- **Data**: ETL workflow, experiment and measurement rigor (train-validation-test), code standards, collaboration (reproducibility and versioning)