Eliot Wong-Toi

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Industry Experience

Data Science Intern, Dexcom, Inc   06/2025–09/2025

- Designed and implemented a continuous glucose monitoring time series clustering workflow covering preprocessing, feature learning, and model evaluation on data from ~15,000 users (~2,500 readings each) using Vertex AI, BigQuery, and Cloud Storage.
- Adapted deep representation learning models for irregular, variable-length time series, integrating patient-level features and improving clustering quality (silhouette score: 0.22 → 0.70).
- Collaborated with clinical and data-science experts to evaluate cluster interpretability and clinical significance, informing next-step deployment considerations.

Research Experience

Graduate Student Researcher, University of California, Irvine   09/2019–Present

- Proposed a Bayesian framework for *generative uncertainty* in diffusion models, formalizing the concept and introducing a semantic likelihood (via CLIP) to filter poor-quality generations; published in **UAI '25**, earned **Best Paper Award at ICLR '25 Workshop**.
- Characterized phase transitions and stability in mean-variance regression and designed an efficient hyperparameter search method for improved training across under- to over-fitting regimes; work selected for an oral presentation at **UAI '24 (top ~13% of accepted submissions)**.
- Formulated and implemented a novel multi-step conformal prediction method for time series forecasting; published in *Machine Learning (2025)*.
- Designed and implemented frequentist power and hypothesis testing tools, including the **MRTSampleSizeBinary R package (>10,000 installs)** with a companion Shiny app for study-design power analysis, and a climate-model design assessment framework (*JAMES 2025*).
- Applied Bayesian methods to cluster NBA players by offensive shot patterns using nonparametric models (*JDS 2022*) and to perform variable selection for radiomic cancer classification, achieving accuracy comparable to junior radiologists.

Skills

ML Frameworks: PyTorch, scikit-learn, Vertex AI, BigQuery, Cloud Storage
Tools/Libraries: Git, LaTeX, pandas, NumPy, matplotlib, seaborn
Methods: Deep Learning, Conformal Prediction, Bayesian Inference, Time Series Modeling, Clustering
Languages: Python, R

Selected Publications

M. Jazbec, **E. Wong-Toi** et al., "Generative Uncertainty in Diffusion Models." UAI 2025 (ICLR 2025 Workshop on "Uncertainty and Hallucination in Foundation Models" Best Paper Award)

E. Wong-Toi et al., "Understanding Pathologies of Deep Heteroskedastic Regression." UAI 2024 (Oral)

E. Wong-Toi et al., "A Joint Analysis for Field Goal Attempts and Percentages of Professional Basketball Players: Bayesian Nonparametric Resource**."** *Journal of Data Science (2022)*

Education

University of California, Irvine   Irvine, CA

PhD in Statistics, Advisor: Stephan Mandt   12/2025
MS in Statistics   03/2022

University of California, San Diego   La Jolla, CA

BS in Mathematics-Computer Science (cum laude), Minor: Economics   06/2019