ZIJIAN ZENG

◇ PROS, Inc. ◇ Houston, TX. ◇ (936) 521-9856 ◇ jacob.zzeng@gmail.com

EDUCATION

Rice University, Houston TX *Aug. 2018 - May 2023*
Ph.D in Statistics and *Master in Statistics*
Thesis topic: *Advanced Bayesian Models for Dependent Data*
Co-Advisors: Meng Li, Ph.D., and Marina Vannucci, Ph.D.
GPA: 4.0/4.0

Duke University, Durham NC *Aug. 2016 - May 2018*
Master in Economics
GPA: 3.7/4.0

Jiangxi University of Finance and Economics, Nanchang China *Sep. 2012 - Jul. 2016*
Bachelor's Degree of Economics
GPA: 3.78 (87.84/100)

RESEARCH INTERESTS

Theory and Methods: Bayesian Modeling, Variable Selection, Nonparametric Bayes, Quantile Regression, Functional Data Analysis, Machine Learning, Deep Learning, Operation Research
Application: Economic Data, Image Data, Network Data, Genetic Data, Microbiome Data, B2B Sales Data

PUBLICATIONS

Peer reviewed

- **Zeng, Z.**, Li, M. and Vannucci, M. (2025+). Bayesian Covariate-Dependent Graph Learning with a Dual Group Spike-and-Slab Prior. *Under Revision*.
- **Zeng, Z.**, Li, M. and Vannucci, M. (2024). Bayesian Image-on-Scalar Regression with a Spatial Global-Local Spike-and-Slab Prior. *Bayesian Anaysis*, 19 (1), 235-260.
  - ∗ Winner, 2022 ASA/MHSS student paper competition
  - ∗ Runner up, 2022 SMI student paper competition
- Ryan, C.T., **Zeng, Z.**, Chatterjee, S., Wall, M.J., Moon, M.R., Coselli, J.S., Rosengart T.K., Li, M., and Ghanta, R.K., (2023). Machine Learning for Dynamic and Early Prediction of Acute Kidney Injury after Cardiac Surgery. *The Journal of Thoracic and Cardiovascular Surgery*, 166(6), e551-e564.
  - ∗ Commentary: Welcome to the machine
- **Zeng, Z.** and Li, M. (2021). Bayesian Median Autoregression for Robust Time Series Forecasting. *International Journal of Forecasting*, 37(2), 1000-1010.

Conference abstracts/proceedings

- **Zeng, Z.**, Rauch, J., Chaudhary, M., Mahajan, M., Wu, CH., Kallesen, R., (2024). An Interpretable Auto-ML Pipeline for B2B Pricing Decisions. *INFORMS Annual 2024* [Abstract]
- Ryan, C., **Zeng, Z.**, Chatterjee, S., Wall, M., Rosengart, T., Li, M. and Ghanta, R., (2022). Machine Learning for Real-Time and Early Prediction of Acute Kidney Injury after Cardiac Surgery. *102nd AATS Annual Meeting Conference Abstract (Peer Reviewed)* [Abstract]

- **Zeng, Z.**, Li, M. and Vannucci, M. (2022). Bayesian Image-on-Scalar Regression with a Spatial Global-Local Spike-and-Slab Prior. *2022 Statistical Methods in Imaging (invited)* [Abstract], *2022 Joint Statistical Meetings (invited)* [Abstract], *The 15th International Conference of the ERCIM WG on Computational and Methodological Statistics (invited)* [Abstract]

WORKING EXPERIENCES

Scientist II *Jul. 2023 - Current*
PROS, Inc. Houston, TX
- Researched and implemented a new method to model time trends, enhancing the AI pipeline. This approach incorporates trends, seasonality, and process shifts, resulting in a forecast accuracy improvement of up to 30% on our real-world dataset.
- Enhanced the hyperparameter tuning methods for PROS AI pipeline, reducing the training time from days to hours, at most, for our real-world datasets. Additionally, this setting has also been shown to improve model prediction accuracy in most cases and has been deployed as the GenIV default search space.
- Introduced new features into the GenIV pricing model, including: Multiple preprocessing steps for data input; Configurable features; A post-processing step for final price recommendations, and A unified pricing rule for both Renuve and Margin Optimization under the same PROS pricing strategy.
- Enhanced the GenIV Deep Neural Network, including: Explanability of feature importance on pricing; Early-Stopping and Learning-Rate Reduction for optimizer.
- Winner of an internal hackathon within the science team.
- Presented the GenIV Deep Neural Network at the INFORMS 2024 Annual Meeting.
- Built a Value Measurement pipeline based on the Causal Impact package from Google.
- Researched methods to incorporating uncertainty quantification in Deep Nueral Network, including both confidence intervals and predictive intervals.
- Researched a general Win/Loss Logistic Model.
- Included in an ongoing patent application.

Academic Visitor *Aug. 2023 - Dec. 2023*
Rice University Houston, TX
- Developing scalable Bayesian methods suitable for high-dimensional models.

Temporary Research Associate *May 2023 - Jul. 2023*
Rice University Houston, TX
- Developing scalable Bayesian methods suitable for high-dimensional models.
- Mentored undergraduates for summer research, including one from the Research Experiences for Undergraduates (REU) program.
- Collaborated with other group members on selected projects.

Intern - Science *May 2022 - Aug. 2022 & Jun. 2020 - Aug. 2020*
PROS, Inc. Houston, TX
- Developed Bayesian hierarchical models for price and demand estimation.
- Designed Constraints for Bayesian dynamic linear model for ticket pricing.
- Implemented AutoML algorithms for ticket price prediction.

Graduate Researcher *Aug. 2018 - May 2023*
Rice University Houston, TX
- Full-time Ph.D. student with a fellowship for study.
- Served as a Research Assistant or a Teaching Assistant based on department's needs.

Research Consultant *Mar. 2018 - May 2018*
Social Science Research Institute at Duke University Durham, NC

- Offered advice to students and researchers at Duke for planning and conducting research projects.

HONORS AND AWARDS

- James R. Thompson Graduate Student Awards (Rice News, COFES News), *Rice (2023)*
- STAT Ph.D Student Travel Award, *Rice (2022)*
- Runner-up Award (Rice News), *Statistical Methods in Imaging (2022)*
  Conference on Statistical Methods in Imaging,
- Best Paper Award (Rice News), *American Statistical Association (2022)*
  Mental Health Statistics Section of the American Statistical Association,
- M.A. Merit Scholar Award, *Duke (2017)*
- Scholar Award of Masters in Economics, *Duke (2016)*
- Outstanding Student - Honors Program with Scholarship. *JUFE (2014 & 2015)*

TEACHING EXPERIENCES

Graduate Teaching Assistant, Rice University

- **STAT 541** *Multivariate Analysis*, *Spring 2023*
- **STAT 615** *Regression and Linear Models*, *Fall 2022*
- **STAT 530** *Causal Analysis*, *Spring 2022*
- **STAT 450** *Senior Capstone Project*, *Fall 2021*
- **STAT 519** *Statistical Inference*, *Spring 2021*
- **STAT 315** *Fall 2018, 2019 and Spring 2019, 2020*
  Probability and Statistics for Data Science
  * Led a team of 8 labbies to design and offer Lab section using R.
  * Established the Lab section of this new course in the year 2018.

Mentor, Rice University

- Sol Kim (REU), Melody Yeh, *May 2023 - July 2023*
  Summer research programs
- Emma Dunn, Dileka Gunawardana, Ranie Lin, Eric Maeng, *Fall 2021*
  Dylan Nguyen, April Yang, Peter Zhu.
  Senior Capstone Projects

REVIEWER EXPERIENCE

- *International Conference on Artificial Intelligence and Statistics*
  [AISTATS 2023], [AISTATS 2024], [AISTATS 2025]
- *NeurIPS Workshop on Deep Generative Models for Health*
  [DGM4H@NeurIPS2023]
- *Symposium on Advances in Approximate Bayesian Inference*
  * Previous *NeurIPS Workshop on Advances in Approximate Bayesian Inference*
  [AABI 2023], [AABI 2024]
- *Bayesian Analysis*
  [Journal Website]

SOFTWARE PACKAGES

- BayesMAR [Code (R)]
- Bayesian Image on Scalar Regression [Code (Python)]
- Bayesian Covariates-Dependent Precision Regression [Under development (Rcpp)]