Erica M. Ryan

erica.m.ryan@outlook.com • 240-925-4887
https://erica-ryan.github.io • https://github.com/Erica-Ryan

EDUCATION

UNIVERSITY OF MARYLAND, COLLEGE PARK, MD
Ph.D. in Economics (GPA 3.9) May 2025
M.A. in Economics December 2022

- Fellowships: NSF Graduate Research Fellowship – March 2020; UMD Flagship Fellowship – March 2020
- Interests: Econometrics and Machine Learning, Household Decision Making, Urban, Labor, Public Finance
- Papers in progress:
  - The effect of place-based policy on migration patterns for workers
  - The effect of differential tuition on enrollment, graduation, and post-grad outcomes for groups of students
  - The effect of upzoning policies on neighborhood dynamics including migration and schools

POST-BACCALAUREATE EDUCATION:

- Harvard Extension School : Linear Algebra, Real Analysis December 2019
- Indiana University East : Abstract Mathematics, Differential Equations August 2019

UNIVERSITY OF MARYLAND, COLLEGE PARK, MD
B.S. Economics, Magna Cum Laude; B.A. Studio Art, Magna Cum Laude, Honors May 2018

- Honors: Phi Beta Kappa, Design, Cultures, and Creativity Honors College, Creative and Performing Arts Scholarship

PROFESSIONAL EXPERIENCE

Economics Department, College Park MD
Research Assistant for Melissa Kearney July 2022-Current

- Updated analysis for a paper by refreshing the data, updating the Stata code, and re-estimating relevant elements.
- Wrote three policy paper drafts on birth rates by marital/educational status and on social programs in the US, Canada, and the UK by reviewing over 50 documents from various agencies, reviewing the prior literature, downloading and cleaning data, and producing descriptive charts in R.

Ipso Facto Solutions, Remote
Economist September 2021-Current

- Estimated a loss allowance forecast adjustment model to be used by 150+ financial institutions by testing for relationships in the data using PCA and RFE, estimating methods (linear regression, ARDL, LASSO, and elastic net), implementing CV and final model selection procedures in R (packages: glmnet, ARDL, caret, torch).
- Estimated a mortgage forbearance model for a research paper that is currently under review for publication by managing a large dataset on AWS S3, configuring Rstudio on AWS EC2, cleaning data and running feature selection procedures (PCA, RFE, decision trees), testing methodologies (random forest, SVM), estimating final models, and producing LaTeX output for the final paper in R and by building a home price index and interest rate forecast engine in Python (TensorFlow).
- Validated two mortgage pricing/valuation models that will price ~$180 Billion in assets by assessing the econometric methodology, assumptions, governance, and documentation.
- Addressed technical and non-technical questions from roughly 15 clients directly through meetings and written memos.

Fannie Mae, Washington, DC
Quantitative Modeler, Model Risk Management June 2018-September 2020

- Reviewed over 25 models in SAS, R, and Python including: cashflows, NPV calculations, profile forecasts, and COVID forbearance take-up by evaluating the econometric methods and limitations, assessing usages, assumptions, and developing/collaborating on comprehensive validation reports.
- Won third place out of 20 teams in a company-sponsored hackathon by testing a variety of machine learning techniques (Bagged Trees, Random Forest, Boosted Trees, etc.) and alternative data sources before estimating our final neural network model in Python (packages: H2O, scikit-learn, TensorFlow, Keras, XGBoost) that improved upon current distressed asset valuation techniques.
- Presented to the Model Risk Oversight Committee on best practices regarding the inclusion of macroeconomic variables in models after conducting research into the literature on practices used throughout the industry and on historical correlations between macroeconomic variables.

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SKILLS

- Proficient in: R (other packages: tidymodels, httr, jsonlite), Python (other Packages: pandas, numpy, matplotlib, requests, BeautifulSoup), Tableau, SQL, LaTeX , MS Suite, G Suite, Adobe Creative Suite, Causal Inference
- Basic Knowledge of: STATA, SAS, HTML, CSS, MATLAB, AWS (EC2, S3, SageMaker), Hive/Hadoop
- Languages: Basic Spanish and Russian

CERTIFICATIONS

- Coursera:
  - Introduction to Machine Learning: Duke University (P2J5LG2VN4KG) — October 2018
  - Neural Networks and Deep Learning: DeepLearning.ai (B8CAGLPVHHM6) — October 2018
  - Structuring Machine Learning Projects: DeepLearning.ai (3KS422DM9ZTR) — November 2018
  - Improving Deep Neural Networks: DeepLearning.ai (9A7TU9PM4YTE) — November 2018
  - Convolutional Neural Networks: DeepLearning.ai (ZCNFFU9LVR4K) — December 2018
  - Sequence Models: DeepLearning.ai (HH9WYXCNAYBN) — January 2019

LEADERSHIP

- Taught 50 students Introduction to Microeconomics during Summer 2023 with an 85% approval rating.
- Mentored two first-year Ph.D. students as measured by their successful completion of the first-year sequence by providing resources and feedback on their performance, and by providing positive reinforcement and a supportive environment to discuss their experiences.
- Mentored two undergraduate students successfully through applying for and landing a job post-graduation by reviewing resumes, sharing job postings, hosting practice case interviews, and providing encouragement.
- Tutored a senior throughout her advanced economics and mathematics courses over two semesters, leading to her successful graduation.
- Ran the Professional Development Events group for the Young Professional Employee Resource Group at Fannie Mae by hosting several events including Excel, Tableau, and R training courses, MBA career fairs, and panel presentations of career paths taken by executives.
- Designed several self-driven projects in my free time including a mentorship matching algorithm that has since been used to match over 200 mentees/mentors within the Risk Management Division at Fannie Mae and an algorithmic approach to playing a spatial guessing game called Disco Zoo, both in Python, and available on my website/github.