

# Alexandra Marr

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## EDUCATION

### Ph.D. in Economics

June 2021

*University of California, Irvine*

**Dissertation:** Three Essays in Economics: Neural Networks and Duration Models, Gender Identity and Unemployment Durations, News and Police Legitimacy.

**Advisor:** David Neumark

**Relevant Coursework:** Big Data, Panel Data, Empirical Methods for Applied Microeconomics, Labor Economics.

### B.S. in Cognitive Science *cum laude*

May 2015

*University of California, Merced*

## SKILLS

- **Python:** Proficient in Python, including but not limited to web-scraping, text scraping, geo-spatial analysis, data cleaning and manipulation, data visualization, implementation of machine learning methods, especially neural networks using the Keras library.
- **Stata:** Proficient in Stata, including but not limited to economic data analysis, data cleaning and manipulation, and data visualization.
- **Microeconomic Methodology:** Proficient in applying Microeconomic methodology to the study of variables of interest, including but not limited to OLS, Regression Discontinuity, Difference in Difference, and Instrumental Variables.
- Some experience in **R, SAS, Matlab, GIS, and SQL.**

## PROFESSIONAL EXPERIENCE

### Economist

Since July 2021

- Work consists of improving the single-family mortgage credit loss model through two avenues:
  - Microeconomics
    - Use my micro background to improve the estimation of loan-level delinquency and prepayment. Including: creating more sample-relevant unemployment rates to better estimate the impact of unemployment shocks, and applying relevant literature to better define the value of a prepayment or delinquent decision.

- Econometrics
  - Use my applied econometric background to improve and update estimation practices. Including: setting up a forecast-based metric of model fit and exploring the cost benefits of various flexible regression techniques including MARS and LASSO.

## **Economic Consultant**

**March 2018-June 2021**

- Aid in the preparation of expert witness testimony for legal discrimination based cases. Tasks include data cleaning of large and complex datasets and analyzing data for discriminatory wage differentials, promotion discrepancies, and hiring practices. Notable projects include scraping resumes for prior work experience.

## **RESEARCH EXPERIENCE**

### **Graduate Student Researcher**

**Summer 2015 - Summer 2020**

#### **Select projects:**

- Created a python program that calculates the average public transit travel times between any two locations in San Francisco using public transportation data and spatial street data (using the Google Maps API for this project would have been too costly).
- Analyzed professor reviews written by students for potential discrimination. The analysis included regressions of the ratings and textual analysis of the written comments.
- Created a python program that scraped Ancestry.com
- Created a python program that cleaned historical city of origin data. The program automatically looked online to see if the city ever existed, and if it didn't, fuzzy matched the city to the most probable existing city.
- Created a python program that could calculate the average travel time between any two locations in New York between 1910-1930 by combining historical transportation and map data.
- Estimated a model that forecasts the energy consumption of individual homes for use in a behavioral intervention experiment.
- Applied a flexible duration model to a ( $n = 2$  million) panel data set of individual credit data.

## **WORKING PAPERS**

(all working papers are available for reading at [AlexandraMarr.net](http://AlexandraMarr.net))

### **Marr, A. (2019) "Neural Networks for Duration Models"**

*Working paper*

*Abstract:* In this paper, I extend current literature on the use of neural networks to estimate proportional hazard models by allowing for time-varying covariates, estimating the baseline hazard, and adding a parameter for unobserved heterogeneity (estimated using fixed effects); I detail two neural network architectures for estimating this model. I also introduce an estimation technique for a flexible quantile

accelerated failure time model using neural networks. Lastly, I demonstrate the flexibility of these methods on both Monte Carlo simulations and empirical data.

### **Marr, A (2020) “Effects of Gender Identity on Unemployment Durations”**

*Working paper*

*Abstract:* In this paper, I extend current literature about the effects of gender identity on behavior by estimating the impact of “breadwinner” stigma on unemployment duration. I leverage heterogeneity across the United States in beliefs about women’s roles to evaluate the effect of gender identity beliefs on the length of unemployment. I find that for men living in states more prejudiced towards women working outside of the household, unemployment durations are negatively correlated with their wives’ earnings. This result contradicts what we would expect from the wealth effects literature but is in line with a model that accounts for the behavioral effects of gender identity.

### **Marr, A (2021) “News and Police Legitimacy”**

*Working paper*

*Abstract:* In this paper, I develop a novel method, using google trends, to estimate the salience of police killing stories in different cities. I then use calls for service data from seven cities across the United States to estimate the relationship between police killing news stories and citizens’ reliance on law enforcement. I find strong evidence that news about out-of-policy killings reduces total calls for service. The evidence for in-policy stories is less straightforward, but results suggest a possible positive relationship between in-policy stories and calls for service. Demographic analysis suggests that race is an important factor in determining effect size; neighborhoods with a more significant black population experience greater changes in calls for service.