Research Topics

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Research Topic 1 - Impact of AI on Job Markets

With the rise of AI, this topic explores how artificial intelligence and automation are impacting different industries, altering job roles, and influencing workforce skills. The research will investigate the nature of this impact, whether that means replacing jobs, creating new opportunities, changing how they operate, or a combination of all three.

Motivation: AI is becoming increasingly powerful and its impacts on the job market are constantly in question. Understanding these trends is crucial for policymakers, businesses, and workers to prepare for the future.

Potential Audiences:

- Policymakers and labor economists
- Businesses and their leaders
- Workers and students

Potential Research Questions:

1. How has the adoption of AI affected employment rates and how does this look in different industries?

To answer this question, we would need a dataset that includes historical employment data across industries and another dataset that records AI adoption trends and automation levels. Ideally, this would also record in the same country/state so the impacts could be more measureable. We could compare employment trends in AI-intensive industries versus industries with lower AI integration or AI adoption in different countries.

2. What types of jobs are most susceptible to automation? Which jobs are going to be augmented the most?

A dataset measuring different types of skills needed in different jobs or industries is also necessary. Understanding or grouping these jobs would us better understand the impact has on the types of jobs AI will change. Ideally, it would also track job transitions and salary

impacts in AI-affected fields. We can also see whether or not these jobs require more training or a different skill set as AI has an impact.

3. How does AI-driven automation impact economic inequality and different tiers of wage levels?

For this question, we need datasets tracking wages and income distribution over time again in specific industires. The dataset should include data on wage growth by sector, employment shifts, and changes in income inequality indices before and after AI adoption.

Potential Data Sources:

Data can come from the following sources: employment and automation data from the Bureau of Labor Statistics (BLS), reports from consulting firms on AI workforce trends, and job posting data from LinkedIn or Indeed to analyze demand shifts.

Research Topic 2 - The Economy

We think it would be interesting to investigate some kind of economic data, especially given recent news and current events. There are many different directions we could take this topic, but possible ideas we discussed that are relevant today could be impacts of trade policies and tariffs, fluctuations in inflation and interest rates, or other governmental policies. This topic could be focused on macro-level data, or we also thought it could be interesting to focus on different cities like Durham. Potential audiences include economic policy makers, people in government, and regular people to inform them. Here are some potential research questions:

- How do interest rates and inflation impact consumer spending?

  For this project, an appropriate dataset would include historical records of consumer spending, inflation rates, and interest rates over time and ideally contain monthly or quarterly data on economic indicators such as the Consumer Price Index, the Federal Funds Rate, and household consumption expenditures. Good places to start our search would be the the Federal Reserve Economic Data, the Bureau of Economic Analysis, and the U.S. Census Bureau.

- How effective are tariffs and other trade policies in reducing prices of goods?

  A good dataset would include historical data on tariffs, import/export prices, and consumer prices for affected goods and contain information/variables on the tariff rate for specific goods, wholesale and retail prices before and after tariff implementation, and overall price index changes. We could look at data from the U.S. International Trade Commission, the Bureau of Labor Statistics, and maybe the World Trade Organization.

- What factors predict housing prices in Durham?

  Datasets housing sale prices alongside predictors such as property size, location, number of bedrooms and bathrooms, crime rates, school district quality, and economic indicators like median income and mortgage rates would be a good fit for this project. Some good sources to look into: Zillow's housing market data, county tax assessor records, and the U.S. Census Bureau.

In terms of potential datasets, the National Beareau of Economic Research, the IMF, and other respected economic organizations have many useful datasets related to this topic.

Research Topic 3 - Environmental Science

We want to investigate some type of environmental/climate data. Specifically, we think that investigating natural disasters like wildfires, floods, sea level rise, etc. could be interesting project topics. We are interested in these topics because they are extremely relevant from an environmental policy and public safety perspective (recent California wildfires, Hurricane Helene, etc.), and they are only poised to get worse as time goes on with climate change effects. Additionally, we think that we could find good data around these events. Here are three potential research questions:

- Can factors like wind speed and rainfall totals predict economic damage caused by hurricanes?

  An appropriate dataset for this project would include historical hurricane records with details on wind speed, rainfall totals, and economic damage estimates. This data could come from sources like the National Hurricane Center, the National Oceanic and Atmospheric Administration, or Federal Emergency Management Agency, which track hurricanes and their financial impact on infrastructure.

- How do factors like humidity level, wind speed, and temperature, and urban environment influence the area burned in a wildfire?

  A good dataset for this project would include wildfire records with corresponding meteorological/geographic data, which could be obtained from agencies such as the U.S. Forest Service, the National Interagency Fire Center, or NASA's Fire Information for Resource Management System.

- Can changes in annual precipitation levels predict the severity of droughts in different regions?

  To answer this question, we could use historical precipitation records from NOAA alongside drought severity metrics (such as the U.S. Drought Monitor), which would allow us to collect important data on precipitation amounts and drought intensity ratings to model predictive relationships.

To find data to answer these questions, we think that the government and environmental organizations mentioned will be good places to start our search.