

TECHNICAL UNIVERSITY OF DENMARK



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# Detection of discrimination in the workforce

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MOTIVATION, DATA, AND SCOPE

42578 ADVANCED BUSINESS ANALYTICS

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# 1 Project description

## Keywords:

1. **Trend detection** to benchmark equal standards
2. Recognize business areas with high **bias** rates in hiring processes
3. Automate and predict future **inequality rates**
4. Apply insights from **analytics** as basis for recommendation

## Abstract

Workforce inequalities remain a significant challenge across OECD countries, impacting wages, hiring practices, promotions, and leadership representation. Despite existing policies aimed at fostering equality, gender and other demographic disparities persist, often reinforced by systemic biases in recruitment, pay structures, and career progression. Traditional approaches to monitoring workplace inequality rely on historical data and retrospective analysis, offering limited predictive power and real-time bias detection.

This project aims to leverage predictive and descriptive analytics to uncover patterns of inequality, establish benchmarks for fair labor practices, and develop solutions to detect and mitigate biases in workforce-related decision-making.

## Objective

To analyze, predict, and mitigate workforce inequalities by applying machine learning techniques to benchmark gender and demographic disparities, detect systemic biases, and forecast future trends in labor market equity.

## Scope

- Descriptive Analytics: Analyze existing labor market data (e.g., employment rates, wages, promotions) to identify trends and disparities.
- Predictive Analytics: Use machine learning models to forecast the evolution of inequalities and the impact of policy changes.
- Bias Detection & Mitigation: Develop algorithms to detect and quantify biases in hiring, salaries, and career advancement.
- Benchmarking & Fairness Measures: Establish data-driven benchmarks to compare workforce equality across OECD nations and industries.

## Datasets

- OECD data sets related to wage gaps and gender inequality in specific business areas.
- Additional data sets found on Kaggle to support analyses and conclusions from OECD data.

## Methods

1. Ensemble learning for predictive modeling
2. NLP based methods for bias in job descriptions
3. Statistical and ML approaches for salary disparities in the current and future work environment
4. Fairness metrics for bias evaluation