

# An Ethical Framework for Addressing Bias in Analytics

Descriptive

**Issue: Clustering can discover underlying biases and codify them without your knowledge (correlation bias)**

Mitigation strategies:

- Inspect your clusters and understand what the data is saying

Analytical method and example case study:

- [Interpretable Clustering \(Case Study: Blue Bikes\)](#)

Predictive

**Issue: Models can make more mistakes for under-represented groups (representation bias)**

Mitigation strategies:

- Test model accuracy by conducting subset analysis of under-represented groups
- Modify process by building subset specific models, as required

Analytical method and example case study:

- [Cohort Studies \(Case Study: Framingham Heart Study\)](#)

**Issue: Convenient proxies used as dependent variables are biased against certain groups (measurement bias)**

Mitigation strategies:

- Work with domain experts to understand the characteristics of true labels
- Invest time and effort to get true labels

Analytical method and example case study:

- [Bias detection with Interpretable Algorithms \(Case Study: Jury Selection\)](#)

Prescriptive

**Issue: Universal benefit reduces a constituent's perceived or expected individual benefit (disenfranchisement bias)**

Mitigation strategies:

- Work with domain experts to create and incorporate fairness variables into the model

Analytical method and example case study:

- [Robust Optimization \(Case Study: Interventional Radiologist Paper\)](#)

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