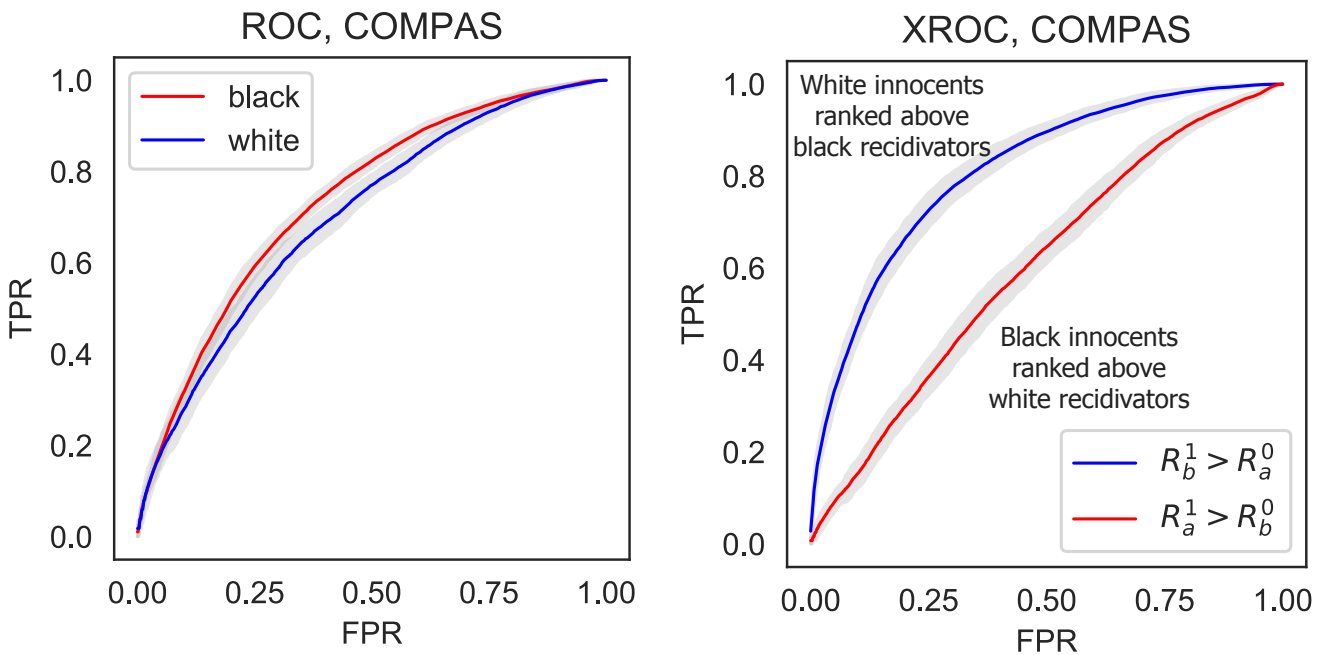
xAUC

Features X, Sensitive attribute $A \in \{0, 1\}$,
Outcome $Y \in \{0, 1\}$ (e.g. Recidivism vs. innocence),
Probabilistic risk score $R = \mathbb{P}(Y \mid X)$



Cross-AUC: $\text{xAUC}(a, b) = \mathbb{P}(\mathbf{R_1^a} > \mathbf{R_0^b})$

R_1^a an instance drawn from $R \mid A = a, Y = 1$

xAUC

Often, probabilistic risk scores are used in settings where binary classification is not the ultimate use case.

The **cross-ROC** curve and **xAUC** summarize group-level disparities in *misranking* errors induced by a score function $R(X)$.