

ATENEO



Paula Gordaliza Pastor

Universidad Pública de Navarra

Ensuring stability in the assessment of algorithmic fairness

Abstract: Recent studies highlight the effectiveness of Bayesian methods in assessing algorithm performance, particularly in fairness and bias evaluation. We present Uncertainty Matters, a multi-objective uncertainty-aware algorithmic comparison framework. In fairness-focused scenarios, it models sensitive group confusion matrices using Bayesian updates and facilitates joint comparison of performance (e.g., accuracy) and fairness metrics (e.g., true positive rate parity). Our approach works seamlessly with common evaluation methods like K-fold cross-validation, effectively addressing dependencies among the K posterior metric distributions. The integration of correlated information is carried out through a procedure tailored to the classifier's complexity. Experiments demonstrate that the insights derived from algorithmic comparisons employing the Uncertainty Matters approach are more informative, reliable, and less influenced by particular data partitions.

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