Dr. Eyke Hüllermeier

Editor-in-Chief

Department of Computer Science

Paderborn University, Germany

Dear Dr. Hüllermeier,

I am submitting our manuscript titled “Fairness in Focus: Quantitative Insights into Bias within Machine Learning Risk Evaluations and Established Credit Models” to be considered for publication in *Data Mining and Knowledge Discovery* as a research article.

In this study, we critically examine the biases present in a machine learning risk assessment tool called EnergyScore, contrasting it with traditional credit score models. Our research addresses two primary objectives:

1. To scrutinize the extent of bias based on classical fairness benchmarks.
2. To innovate in bias analysis by augmenting the number of protected categories observed and proposing a simple quantitative evaluation heuristic.

Our findings indicate that for low-income customers, the variance across all threshold scenarios was over seven times lower when using EnergyScore compared to traditional FICO scores. This significant reduction in variance highlights the potential of machine learning models to improve fairness and provide more consistent treatment across various protected classes, but moreover, builds upon existing bias evaluation methodology by designing a simple comparison heuristic to quantify variance in protected class treatment.

The research aligns with *Data Mining and Knowledge Discovery’s* focus on the knowledge discovery process, specifically in the area of knowledge discovery process in evaluation and as an application case study into bias detection. The insights gained from this research reinforce the importance of addressing algorithmic fairness, an increasingly necessary component as the proliferation of artificial intelligence increases.

This manuscript has not been published elsewhere and is not in consideration by another journal. The author has approved the manuscript and agree with its submission to *Data Mining and Knowledge Discovery.*

Sincerely,



Jacob Ford, Senior Data Scientist

Solstice Power Technologies, LLC