**Abstract: GLOBAL STEAM PRICING: FAIRNESS & TIMING**

Steam often struggles to align global pricing strategies with local economic realities, creating significant affordability disparities driven by the disconnect between exchange-rate volatility and local purchasing power. This generates a dual uncertainty for consumers: objectively assessing whether a regional price is fair, and determining the optimal timing for purchase. To resolve this, this study establishes a two-stage decision framework to model economic price equity and predict the time-to-event for discounts of at least 20%.

The study analyzed real-time pricing for the top 300 games across 22 regions using the Steam Store API, integrated with historical price logs from the 'Is There Any Deal' API. To calculate a 'Fairness Index,' the methodology constructed baseline reference prices using purchasing power, tax rates, and genre tags. Feature selection utilized f_regression to identify top candidates, followed by a comparison of Linear, Ridge, and Lasso regressions against a Random Forest model using 5-fold cross-validation. Regarding discount timing, the study engineered 'past-only' aggregates—such as release age and days-since-last-sale—to prevent data leakage. These features trained L2-Logistic Regressions for fixed-window probabilities and discrete-time hazard models to estimate expected wait times, validated via a strict temporal split.

In fairness modeling, the Random Forest approach significantly outperformed linear baselines, achieving an $R^2$ of 0.9245 and reducing RMSE by 56.3%. Application of this framework revealed that while 81% of prices fall within a 'fair' range, 8.1% constitute statistical outliers that are significantly overpriced. Regarding discount prediction, the hazard model achieved an AUC_ROC of 0.61 and an AUC_PR of 0.21.

In conclusion, the fair pricing model effectively isolates regional outliers by comparing listed costs against predicted 'fair' prices, allowing users to objectively assess value. Regarding the predictive model, the results confirm that calendar seasonality, rather than wait duration, is the critical factor for discounts. Collectively, this study resolves consumer uncertainty and empowers budget-conscious players with data-driven purchasing strategies.