

Bias Detection Report

Distribution Bias Analysis for Date of Birth in COMPAS Dataset

1. Shannon Entropy and Balance Metric:

- Shannon Entropy: 13.0876
- Balance: 0.9809
- Bias Level: Level 1 (No Bias)
- Conclusion: The distribution of 'DateOfBirth' is balanced according to Shannon Entropy and Balance metrics.

2. Max/Min Ratio:

- Max/Min Ratio: 10
- Bias Level: Level 4 (Significant Bias)
- Conclusion: A significant imbalance is evident between the most and least frequent categories.

3. Normalized Entropy:

- Normalized Entropy: 0.9809
- Bias Level: Level 1 (No Bias)
- Conclusion: Indicates a well-distributed feature.

4. Chi-Square Test:

- Chi-Square Statistic: 25592.10

- p-value: 0.0
- Bias Level: Level 5 (Extreme Bias)
- Conclusion: Significant deviation from expected uniform distribution.

5. Kolmogorov-Smirnov Test:

- KS Statistic: 0.0176
- p-value: 0.0785
- Bias Level: Level 1 (No Bias)
- Conclusion: No significant distribution bias.

Overall Bias Level

The overall bias level for 'DateOfBirth' is Level 3 (Moderate Bias). This conclusion accounts for mixed results across different methods.