Bias and Fairness Checklist

1. Data Bias Identification

Checklist Item	Completed	Notes
Statistical Analysis:		
- [ ] Have you performed statistical analysis to identify imbalances in the dataset?		
- [ ] Are there significant differences in feature distributions across demographic groups?		
Visualization:		
- [ ] Have you visualized data distributions to detect potential biases?		
- [ ] Are visualizations available for different demographic segments?		
Demographic Analysis:		
- [ ] Is the representation of all relevant demographic groups sufficient in the dataset?		
- [ ] Have you identified any underrepresented groups that require attention?		
Feature Analysis:		
- [ ] Have you analyzed feature importance to identify biased predictors?		
- [ ] Are there features that indirectly capture sensitive attributes (e.g., zip code as proxy for race)?		

2. Model Bias Detection

Checklist Item	Completed	Notes
Error Analysis:		
- [ ] Have you conducted error analysis to identify disparities in model performance across groups?		
- [ ] Are error rates significantly higher for specific demographic groups?		
Feature Importance Analysis:		
- [ ] Have you assessed which features most influence model decisions?		
- [ ] Are any of these features contributing to biased outcomes?		
Intersectional Analysis:		
- [ ] Have you evaluated model performance at the intersection of multiple demographic factors?		
- [ ] Are there compounded biases affecting certain subgroups?		

3. Bias Mitigation Implementation

Checklist Item	Completed	Notes
Pre-processing Techniques:		
- [ ] Have you applied data augmentation to increase representation of underrepresented groups?		
- [ ] Is re-sampling used to balance class distributions across demographic groups?		
- [ ] Have you performed feature selection to remove biased features?		
In-processing Techniques:		
- [ ] Have you incorporated fairness constraints into the model training process?		
- [ ] Are you using adversarial debiasing to reduce bias in model predictions?		
- [ ] Is regularization applied to minimize the impact of biased features?		
Post-processing Techniques:		
- [ ] Have you adjusted decision thresholds to achieve fairness across groups?		
- [ ] Is calibration used to ensure accurate and fair probability estimates for all groups?		
- [ ] Have you transformed model outputs to reduce bias without compromising performance?		

4. Fairness Evaluation

Checklist Item	Completed	Notes
Demographic Parity:		
- [ ] Have you measured demographic parity across all relevant groups?		
- [ ] Are the decision rates similar across these groups?		
Equal Opportunity:		
- [ ] Have you evaluated equal opportunity by measuring true positive rates across groups?		
- [ ] Are the true positive rates comparable across all demographic segments?		
Equalized Odds:		
- [ ] Have you assessed equalized odds by measuring both true positive and false positive rates?		
- [ ] Are these rates consistent across all groups?		
Predictive Parity:		
- [ ] Have you checked predictive parity by measuring positive predictive values across groups?		
- [ ] Are the predictive values equitable across all demographic segments?		