Fairness-Aware Ranking Module

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1. Problem Addressed

- Gender-based bias in candidate evaluation
- College tier-based discrimination
- Location-based inequality
- Socioeconomic background influence on ranking decisions

2. Core Features

- Blind Profile Evaluation: Sensitive attributes such as gender, college name, and location are hidden during scoring.
- Fairness Constraints in Ranking: Incorporates algorithmic constraints to prevent disproportionate representation.
- Bias Detection Dashboard: Visual analytics to identify potential bias patterns in rankings.
- Demographic Parity Monitoring: Ensures equal selection rates across different demographic groups.
- Equal Opportunity Adjustment: Maintains similar true positive rates across groups.
- Score Recalibration: Adjusts weighted scores to correct unintended bias.
- Representation Tracking: Continuously monitors diversity across shortlisted candidates.
- Fair Ranking Reordering: Reorders final ranking if imbalance is detected while maintaining merit-based logic.

3. Technical Implementation Overview

- Weighted competency scoring independent of demographic attributes
- Post-processing fairness optimization algorithms
- Statistical fairness metrics computation (Demographic Parity, Equal Opportunity)
- Automated bias flagging when thresholds exceed defined limits
- Transparent audit logs for explainability

4. Key Benefits

- Promotes equitable opportunity allocation
- Reduces systemic and implicit bias
- Improves trust and transparency in ranking decisions
- Ensures compliance with ethical AI standards
- Provides explainable and auditable decision-making