Football Analytics & Salary Fairness Platform

TEAM M006

Ahmed Al Hussain | Mahar Al Shakesaleh | Abdulrahman Aldhuwaihi
Mohammed Binagag | Mohammed Al Naser | Abdullah Almajed
Coach: Abdullah Almeer

ISE · ACFN · 3 · ICS

Objective

Problem Statement

Professional football clubs often make salary and transfer decisions using subjective judgment, reputation, and fragmented data sources. This causes inflated wages, inefficient spending, and weak alignment between player compensation and actual on-field contribution. The project aims to build an integrated platform that predicts fair salaries, identifies overpaid and undervalued players, and supports financially sustainable club decisions.

Constraints

- A player must have at least 5 match appearances before fairness evaluation.
- Only verifiable club-to-club transfer compensation is used; agent fees are excluded.
- Backend and frontend must use encrypted communication.
- The system depends on external football and salary data sources.
- Sensitive data must be protected.
- Predicted salaries must remain positive and reasonable.

Specifications

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- Salary reduction in backtests **≥ 20%**
- Spearman correlation between fair salary and performance **ρ ≥ 0.50**
- Operational error rate **< 1%**
- At least **60%** of predictions fall within **±30%** of actual fair salary.
- CSV, Excel, and PDF export with **99% consistency** and **≤ 5 s** generation time
- Filtering by player attributes in **< 2 s**
- Bilingual user interface: **Arabic + English**
- Dark/light mode switching in **≤ 1 s**
- Batch processing **≥ 500 player records/minute**
- Detect and flag **100%** of predictions outside **3 standard deviations**
- System uptime **≥ 99% monthly**
- Fairness classification: Overpaid **≥ +15%**, Underpaid **≤ -15%**

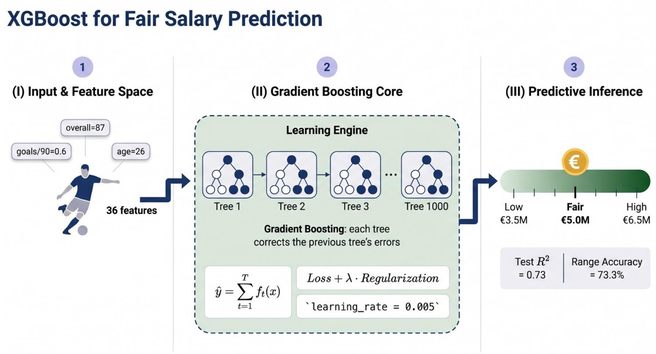
Integrated Specifications

- Transfer fee prediction **MAPE ≤ 30%**
- Secure REST API with authentication and **HTTPS/TLS 1.2+**
- Support **1000+ simultaneous users**
- Fair salary estimates within **±30%** of market benchmarks for at least **60%** of players.

Prototype Development

The project prototype is a **computer-based Football Analytics & Salary Fairness Platform**. It integrates historical match data, salary records, market values, and player statistics into one system. The prototype includes:

- a **fair-salary prediction model**,
- an **automated data pipeline**,
- a **bilingual web dashboard**,
- **reporting/export tools**.



Validation

- Historical backtesting showed **35.0% salary reduction**, exceeding the **20%** target.
- Spearman correlation between fair salary and performance reached **0.6446**, exceeding the **0.50** requirement.
- Prediction accuracy exceeded the target, with **more than 70%** of predictions within **±30%**.
- Report generation met timing targets.
- Batch processing performance greatly exceeded the minimum, reaching **9,548 players/minute** in testing.
- Availability met the requirement with infrastructure exceeding **99% uptime**.

Conclusion

The Football Analytics & Salary Fairness Platform successfully demonstrates that player salary decisions can be improved through a data-driven approach. The prototype combines machine learning, optimization, and software engineering to produce fair salary estimates, detect overpaid and undervalued players, and support scenario-based decision-making. Final validation shows the system met its key constraints and specifications.