DSCI 510

Final Project Proposal

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Bear Necessities: Identifying the Chicago Bears' Next Draft Gem

1. What problem are you trying to solve?

The Chicago Bears are approaching a critical point in their rebuilding process, and choosing the right position to prioritize in the 2026 NFL Draft could significantly impact their competitiveness. My project aims to analyze the Bears' 2025 season performance across all positional groups using publicly available NFL statistics. The goal is to identify which position groups are underperforming relative to league averages and predict (1) **which position the Bears most urgently need to draft in 2026**, and (2) **which college prospects best fit that positional need** based on performance metrics.

2. How will you collect data and from where?

Data Sources (web-scraped + API):

- **Pro-Football-Reference (PFR):** Team stats, positional rankings, player advanced metrics (HTML scraping).

- **ESPN & NFL.com**: Depth charts, injury reports, efficiency ratings (HTML scraping).

- **CFB Data API** (public API): College football player stats, useful for selecting draft prospects.

- **Draft/Scouting Websites** (mock draft aggregator pages): Used to compile a candidate list of college prospects.

3. What analysis will you perform?

Using Pandas and NumPy, I will perform the following analyses:

Team & Positional Analysis

- Compute per-game and per-play performance metrics (EPA, yards allowed, pressures, passer rating, etc.).

- Compare Bears' positional performance to **league averages and standard deviations**.

- Rank positional weaknesses using z-score deviations and percentile rankings.

Draft Prospect Fit Analysis

- Clean and merge college player datasets across multiple statistical categories (passing, rushing, receiving, defensive grades).

- For the identified "need" position, score players using a weighted metric (production, efficiency, age, consistency).

- Match college prospects to Bears' roster needs based on statistical similarity.

4. What visualizations will you create?

- **Bar charts** showing the weakest positional groups based on standardized scores.

- **Diverging bar charts:** to show z scores for positional needs for Bears

These visualizations will help clearly communicate which position group the team should prioritize and which prospect is the statistically strongest fit.