

CSE 478 Project Proposal

Title: The 3-Point Revolution: How the NBA Game Has Evolved Since 2000

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1) Summary / Story

Our work employs all datasets of Nathan Lauga's Kaggle NBA Games Dataset (1995–2023) to illustrate how NBA playing style and scoring patterns have evolved during the last 20 years, specifically the explosion of the 3-point shot. Basketball strategy has evolved through analytics and modern styles of play, as seen in the league-wide and team-specific patterns of shot choice, tempo, and overall scores. Supported by some interactive transitions and graphs, the story will be told through a scrolling D3.js web story that will lead the user from team success development, shot allocation, and scoring effectiveness.

2) Dataset (Kaggle) & Scope

Dataset: NBA Games (1995–2023)

Source: Kaggle – Nathan Lauga's NBA Games Dataset

Files Used: games.csv, teams.csv, players.csv, ranking.csv, and details.csv

Description:

Game-, team-, and player-level statistics for every NBA season from 1995 to 2023 are included in the dataset. Every file brings another level of analysis: Date, teams, scores, 3-pointers, and results are all included in the games.csv base dataset. Teams.csv contains the team's location and abbreviation metadata; players.csv contains the player's career information and summary performance; ranking.csv contains the team's seasonal performance and ranking; and details.csv contains the player's individual-game statistics, such as points, assists, and rebounds. These datasets will be combined to offer a multi-level analysis that links league evolution, team trajectory, and player performance.

3) Visualizations & Interactions

At least five various D3-based visualizations will be used: Line Chart: Show league-wide 3PA%, pace, and scoring trends since 2000. Stacked Area Chart: Show percentage of total points from 2s, 3s, and FTs by year. Scatter Plot: Show 3P% vs. 3PA per team per season. Heatmap: Show teams' 3-point frequency and success rates by season. Geographic Map: Map team locations by color of offensive efficiency. Innovative View – "Momentum Spiral": An individual spiral chart revealing score gaps and momentum shifts through iconic games. All visualizations will be interactive and coordinated with one another within a scrollytelling narrative built with D3.js and Scrollama.

4) Narrative (Scrollytelling) Outline

Introduction: Overview of how analytics reshaped the NBA. Rise of the 3-Point Era: Line chart

showing exponential growth of 3PA%. Team Style Evolution: Heatmap showing differences across franchises. League Scoring Dynamics: Stacked area of scoring composition (2s, 3s, FTs). Geographic Visualization: Map of offensive efficiency by team city. Innovative Spiral View: Game momentum visualization for key playoff games. Conclusion: Reflection on how data-driven strategies transformed basketball.

5) Technical Plan & Milestones

For responsive design, we will use Bootstrap; for data visualization, we will use D3.js; and for scrollytelling, we will use Scrollama.js. Python (Pandas) will be used for data preparation, which will involve combining player, team, and game data to get derived metrics like the team's 3-point rate, win ratio, and scoring efficiency. Oct 27: Data cleaning and aggregation. Nov 10: Three core visualizations completed. Nov 20: Add map and scatter interactions. Nov 27: Implement innovative spiral view. Dec 1–3: Poster session demo. Dec 5: Final write-up submission.

6) Risks & Mitigation

Missing data or incomplete player records – use interpolation or filtering. High dataset complexity – modular preprocessing in Python. Performance issues – pre-aggregate and cache visual states. Scrollytelling sync bugs – test transitions and user flow early.

7) Deliverables

1. Interactive D3.js web experience.
2. Preprocessed merged dataset.
3. Documented GitHub repository.
4. Poster (25×30 inches) for presentation.
5. Final report (2–4 pages).

References

Nathan Lauga – Kaggle: NBA Games Dataset (1995–2023) Basketball Reference – Historical Team and Player Stats FiveThirtyEight – “The NBA’s Three-Point Revolution” Scrollama.js & D3.js Documentation