Kobe Bryant Shot Selection

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Background

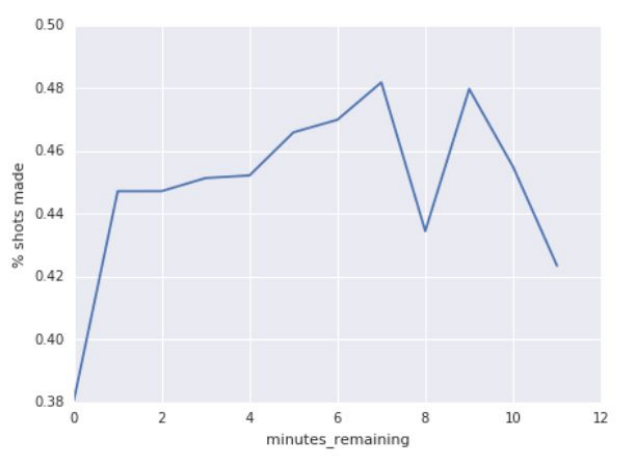
- 8.23.1978 -- 1.26.2020
- Helicopter accident at age 41
- One of the best players in NBA history
- Also known as “Black Mamba”
- Joined at the age of 17
- 20-year career with the Los Angeles Lakers
- Won 5 championships
    - 2000, 2001, 2002, 2009, 2010

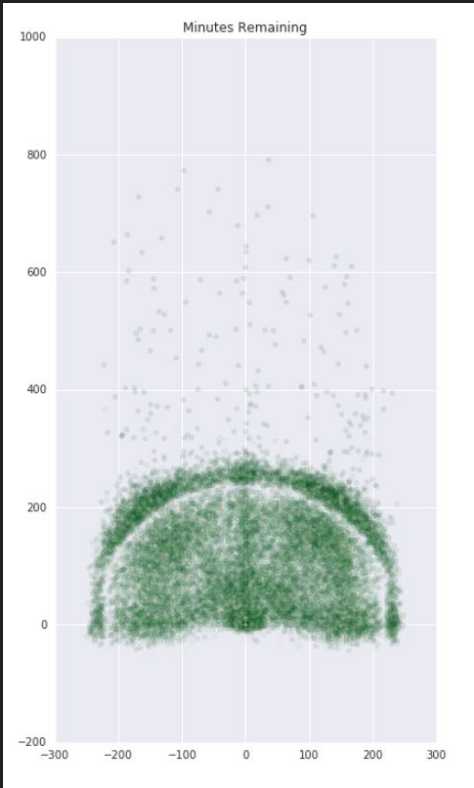
Data Description

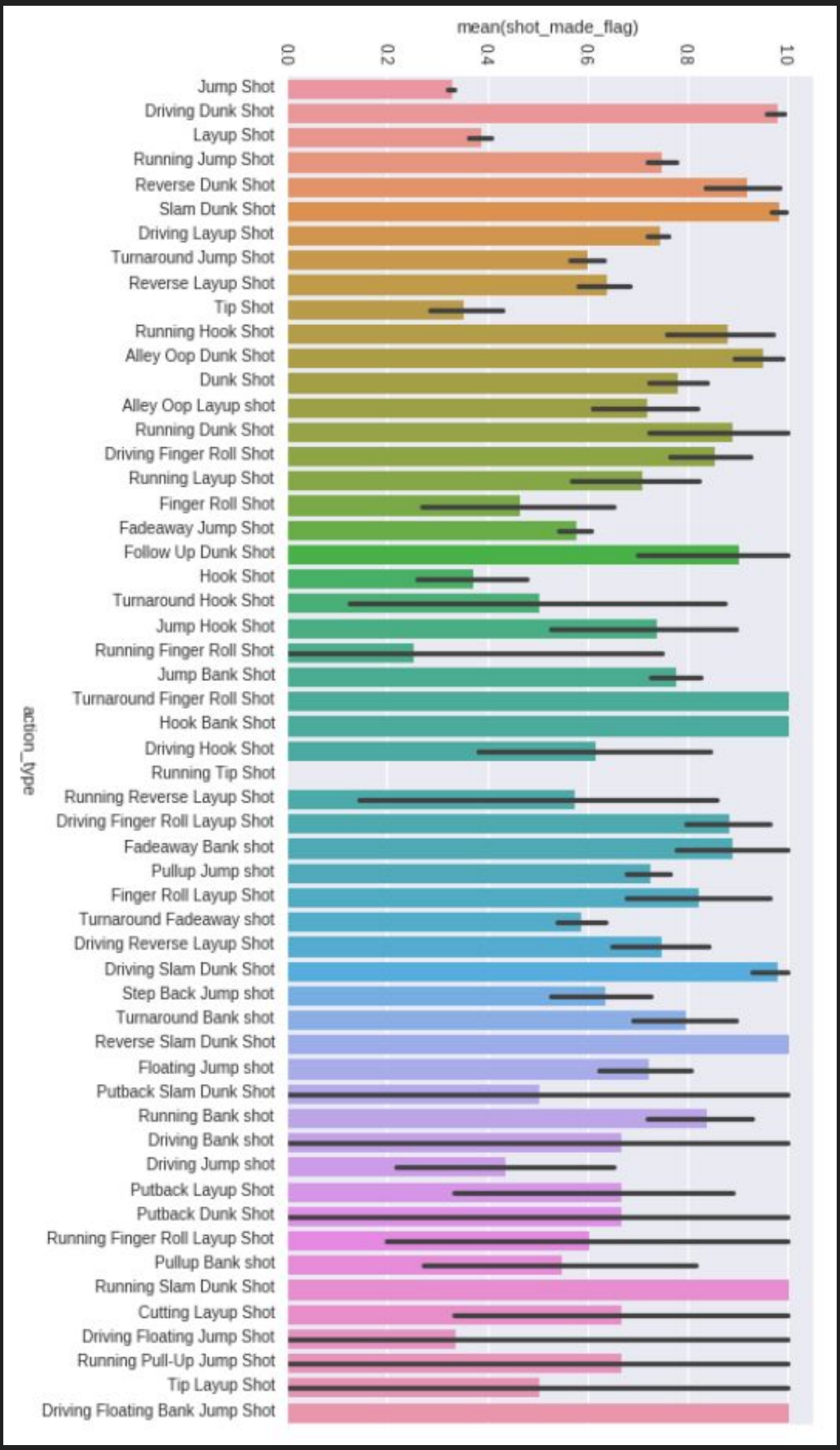
- Classification
- All 20-year career field goal attempted
- 25 columns
  - Object: action_type, combined_shot_type, season, shot_type, shot_zone_area, shot_zone_basic, shot_zone_range, team_name, game_date, matchup, opponent
  - Numeric: game_event_id, game_id, lat, loc_x, loc_y, lon, minutes_remaining, period, playoffs, seconds_remaining, shot_distance, shot_made_flag, team_id, shot_id
- Predict whether the basket went in (shot_made_flag)

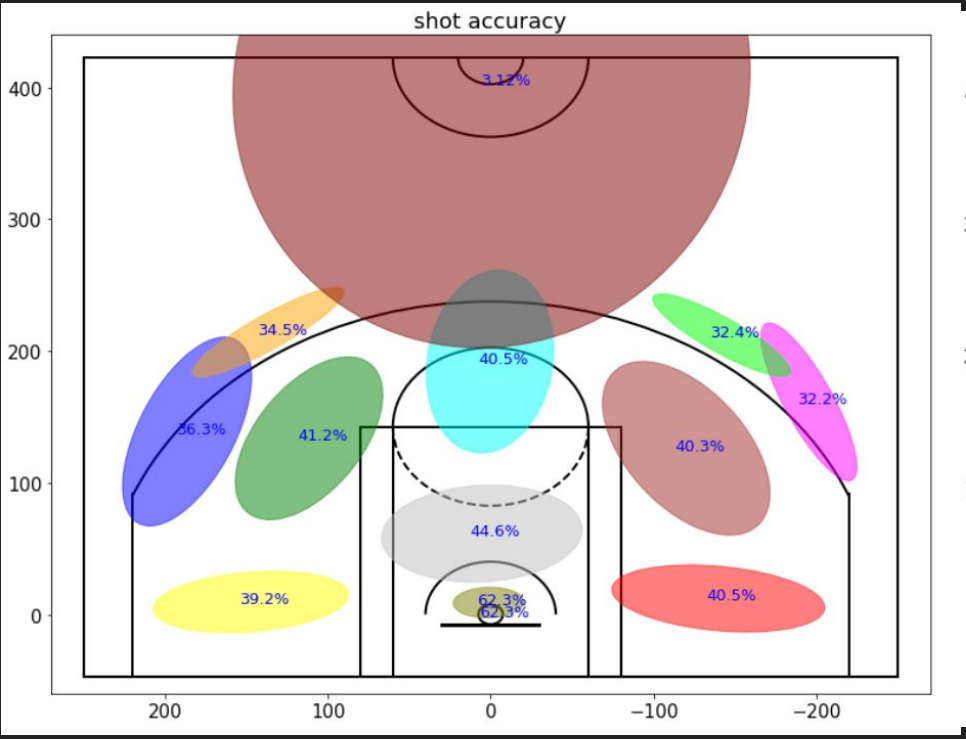
Visualization

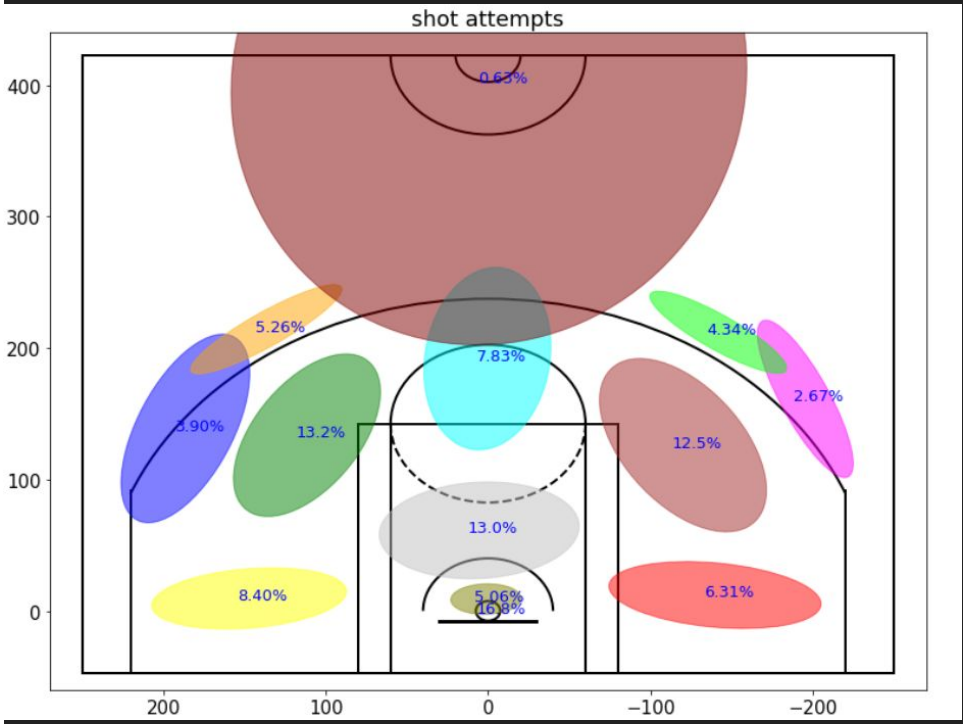
- Shot location by minutes remaining
- Shot made percentage with distance or time remaining





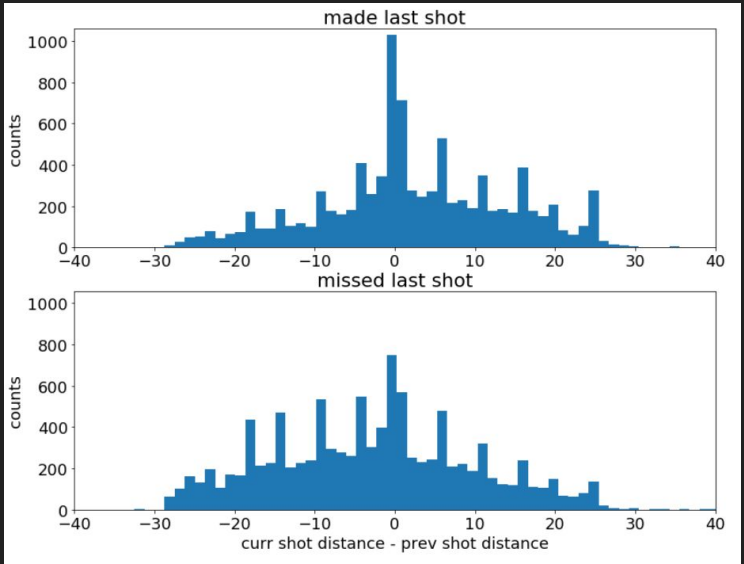

mean(shot_made_flag)
0.0
0.2
0.4
0.6
0.8
1.0
action_type
Jump Shot
Driving Dunk Shot
Layup Shot
Running Jump Shot
Reverse Dunk Shot
Slam Dunk Shot
Driving Layup Shot
Turnaround Jump Shot
Reverse Layup Shot
Tip Shot
Running Hook Shot
Alley Oop Dunk Shot
Dunk Shot
Alley Oop Layup shot
Running Dunk Shot
Driving Finger Roll Shot
Running Layup Shot
Finger Roll Shot
Fadeaway Jump Shot
Follow Up Dunk Shot
Hook Shot
Turnaround Hook Shot
Jump Hook Shot
Running Finger Roll Shot
Jump Bank Shot
Turnaround Finger Roll Shot
Hook Bank Shot
Driving Hook Shot
Running Tip Shot
Running Reverse Layup Shot
Driving Finger Roll Layup Shot
Fadeaway Bank shot
Pullup Jump shot
Finger Roll Layup Shot
Turnaround Fadeaway shot
Driving Reverse Layup Shot
Driving Slam Dunk Shot
Step Back Jump shot
Turnaround Bank shot
Reverse Slam Dunk Shot
Floating Jump shot
Putback Slam Dunk Shot
Running Bank shot
Driving Bank shot
Driving Jump shot
Putback Layup Shot
Putback Dunk Shot
Running Finger Roll Layup Shot
Pullup Bank shot
Running Slam Dunk Shot
Cutting Layup Shot
Driving Floating Jump Shot
Running Pull-Up Jump Shot
Tip Layup Shot
Driving Floating Bank Jump Shot


shot accuracy
3.12%
34.5%
40.5%
32.4%
32.2%
36.3%
41.2%
40.3%
44.6%
39.2%
62.3%
40.5%
400
300
200
100
0
200
100
0
−100
−200


shot attempts
0.63%
5.26%
7.83%
4.34%
2.67%
3.90%
13.2%
12.5%
13.0%
8.40%
5.06%
6.31%
400
300
200
100
0
200
100
0
−100
−200

Notebooks

- Confidence
  - After making a shot, he takes a larger risk and throws from further distance



- Hot hand effect
  - Created a shotDifficulty model and generate 95% confidence interval
  - For both after made a shot and missed a shot

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provided that kobe MADE the previous shot:
according to "shotDifficulty" model, 95% confidence interval [0.425732530575, 0.
446428638004]
and Kobe actually made 0.4390376660134988, which is within confidence interval
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provided that kobe MISSED the previous shot:
according to "shotDifficulty" model, 95% confidence interval [0.444870245146, 0.
464189059611]
and Kobe actually made 0.45338225609182425, which is within confidence interval
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Modeling

- Total of 5000 missing shots that we need to predict
- Converting
  - remaining _time from remaining minutes and seconds
  - Separate game_date to year, month, day
- Dropping
  - Non related values: team_name, team_id, game_id, game_event_id
  - Duplicate values: lat, lon
  - Converted values: game_date, remaining_seconds, remaining_minutes
- Models most notebooks used
  - RandomForestClassifier
  - XGBClassifier