

Application of Machine-Learned Ranking to Athletic Recruitment Through Pathlete's User Suggestion System

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Problem

The current college athletic recruitment system is inefficient and cumbersome.

Coaches

- Often lack budget to recruit across the country.
- Lack the time needed to filter thousands of emails from potential recruits.
- Aren't guaranteed to find the right athletes for their team.

Athletes

- Unable to communicate with coaches, and often don't know how to present themselves.
- Unable to pay for existing recruitment services.
- Have a difficult time finding college programs that accept their specific skillset.

Solution

An online platform capable of dynamically learning the preferences and capabilities of coaches and athletes to minimize the time wasted throughout the recruitment process.

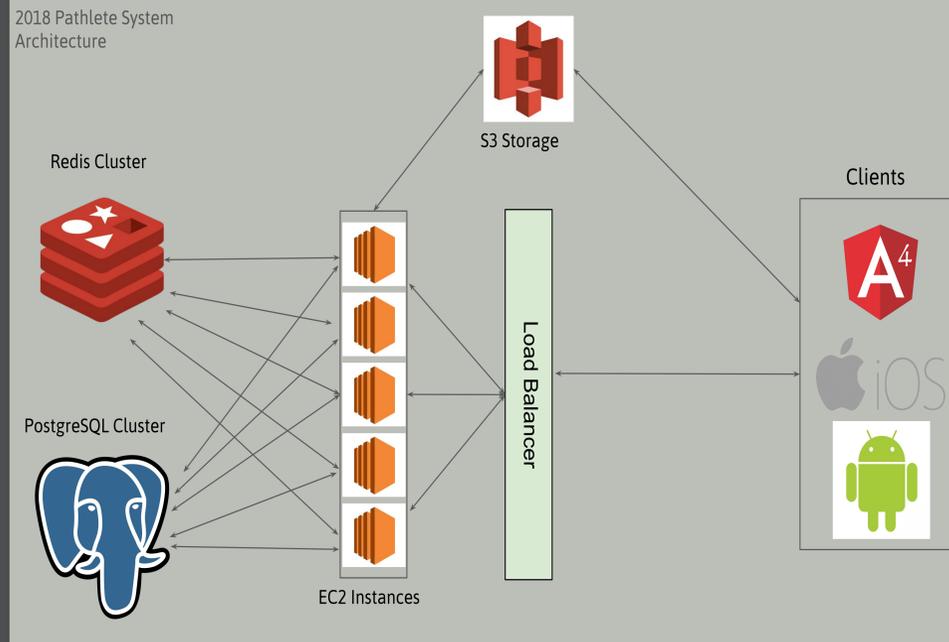
- A suggestion system that offers a ranking of relevant candidates for each user.
- Connection filtering and a communication platform for athletes and coaches to interact.
- Personalized profile that allows athletes to showcase gameplay statistics, videos, and schedules.
- An easy to use UI and social platform to keep users engaged and interested in the site.

User Suggestion System

This project focused only on development of the ranking system of athletes for college coaches.

Given a database of athlete profile characteristics and the interests of a specific coach, generate a ranking of athletes where the highest rank is the most relevant athlete.

- Profile characteristics are generated using the statistics uploaded by athletes.
- Interests are determined by the behavior of a coach while using the site.

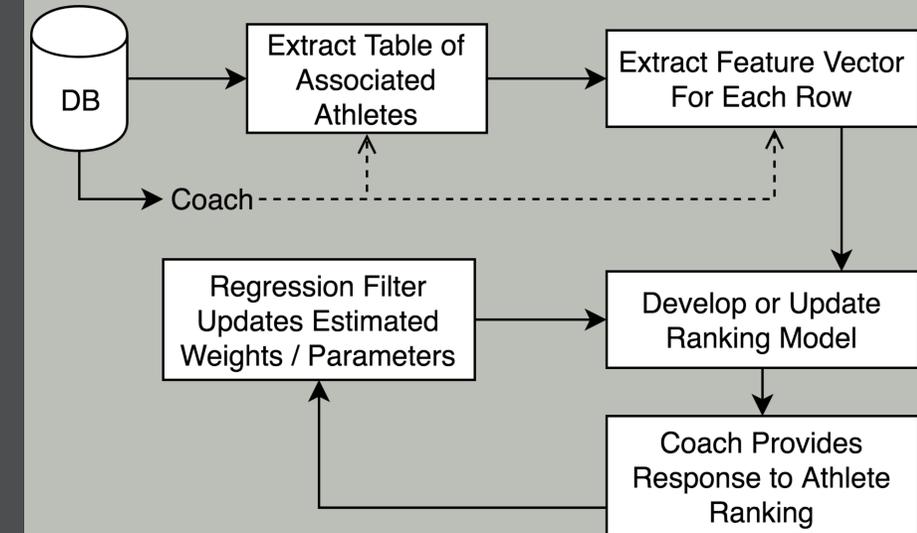


Learning to Rank

- Extract a feature vector from the profile characteristics and coaches' interests.
- Develop a ranking model of the form:

$$f(x) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k$$
 where $\{x_1, \dots, x_k\}$ are parameters that weight individual features.
- Weights are tuned using a least mean squares regression filter.

Learning System



Prediction Accuracy

- Ranking is trained when the coach selects or spends time on the profile of an athlete through the search and suggestion UI.
- Training data was pulled from NBA athletic recruitment statistics to test the effectiveness of the method.
- The ratio of actually selected athletes to the number of athletes presented to the coach was used as an evaluation of the ranking model.
- Preliminary testing demonstrated an average precision of about 60%.

Future Work

- A dataset of professional athletics is not representative of the relationship between college coaches and student athletes. Method should be tested on live data.
- An LMS filter is a fairly basic method, so more complex learning algorithms could be used.
- Develop a method to dynamically determine which features should be extracted for a specific coach.