

Abstract

A Machine Learning approach for In-Race Cycling Performance Prediction

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1. Abstract

The prediction of race performance is a hard task, as many factors are involved: the type of race, road conditions, team strategy, the current physical preparation/condition of the rider, weather condition and the unpredictability of the race itself. Traditionally, to approach this problem, a lot of expert knowledge (often subjectively defined) is necessary to find the right patterns for predicting the performance. As the amount of available structured data that is produced is increasing ever so more (such as race results, power values, heart rate, etc...), there is an opportunity to make this prediction more data-driven. Machine Learning (ML) algorithms have been successful in finding complex patterns in many different fields. In this paper, we propose an ML algorithm to predict the outcomes for one-day road cycling races.

This algorithm can generate a prediction based on past data of previous similar races, historical weather data and the overall team performance. This proof-of-concept has been evaluated with the previous editions of important one-day cycling races (e.g., Tour of Flanders, Paris Roubaix, etc.). For the Tour of Flanders, the generated model correctly predicted 6 and 5 riders out of the top 10 for, respectively, the editions of 2018 and 2019. This performance is comparable to the one achieved by the predictions of professional sports commentators. In the short term, we plan to

extend the evaluation with other one-day races. Later on, we will also consider multi-stage races and extend the algorithm with additional features and techniques to increase the accuracy of our predictions.



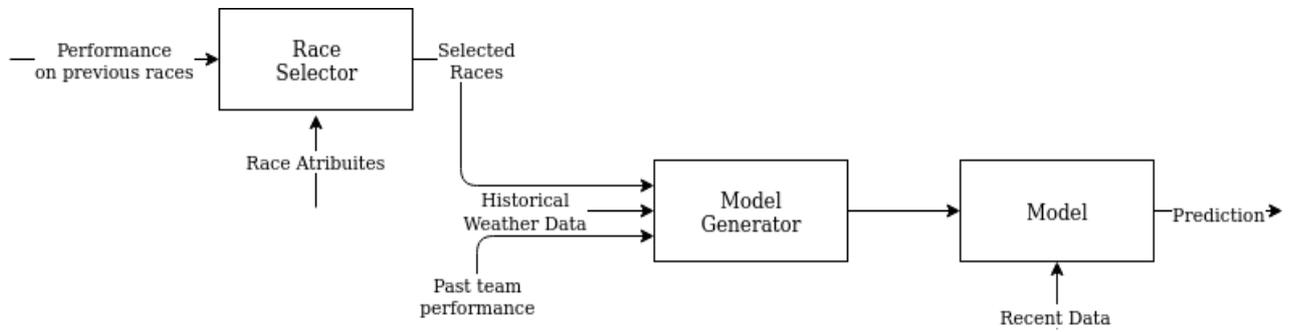


Figure 1. Performance prediction