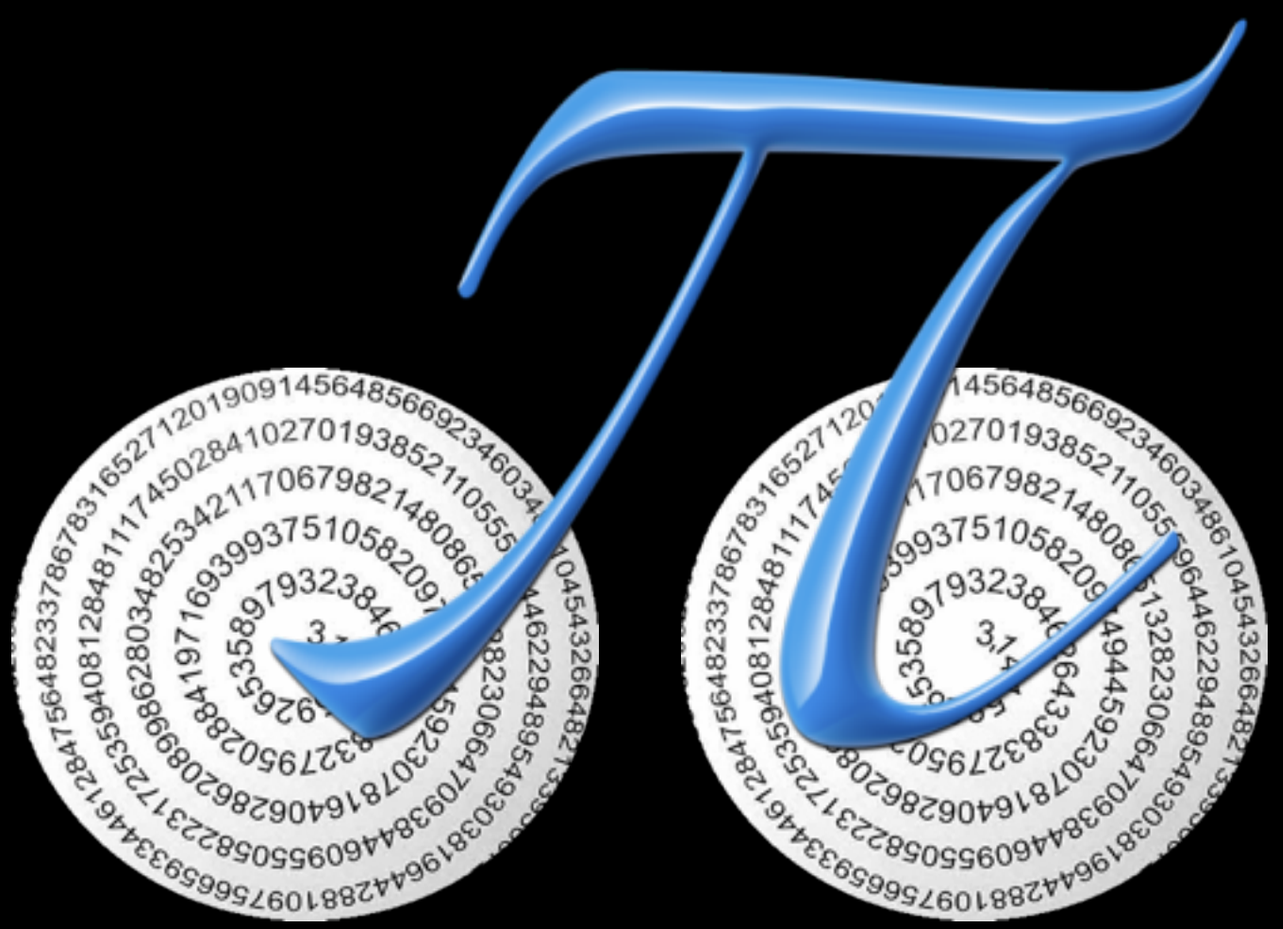
Cyclitics



By Seth Hendrickson

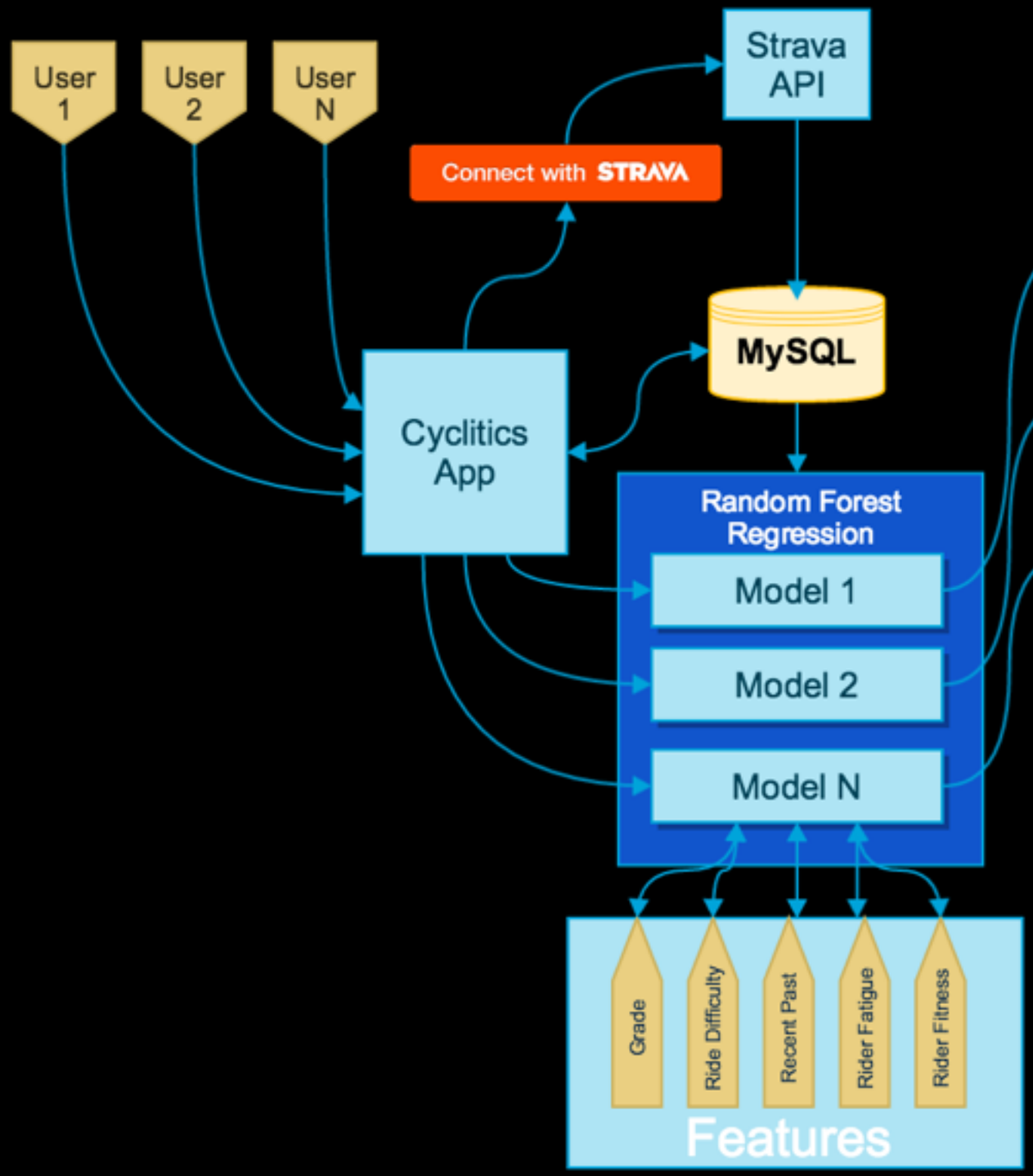
The Problem

You’re a cyclist…

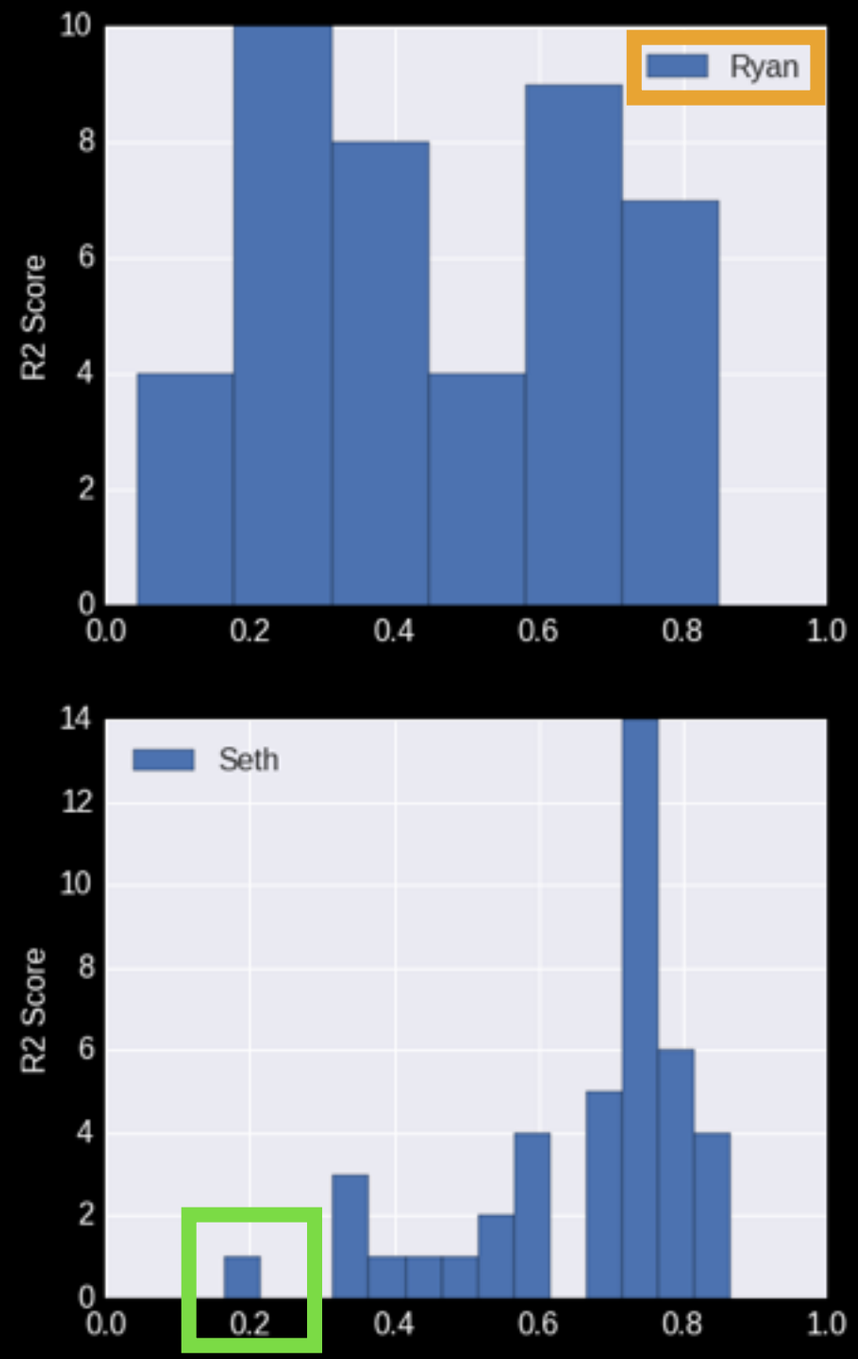
- How long will a ride take you?
- How should you set your pace?
- How do you know if you did well?
- How do you compare to your friends?

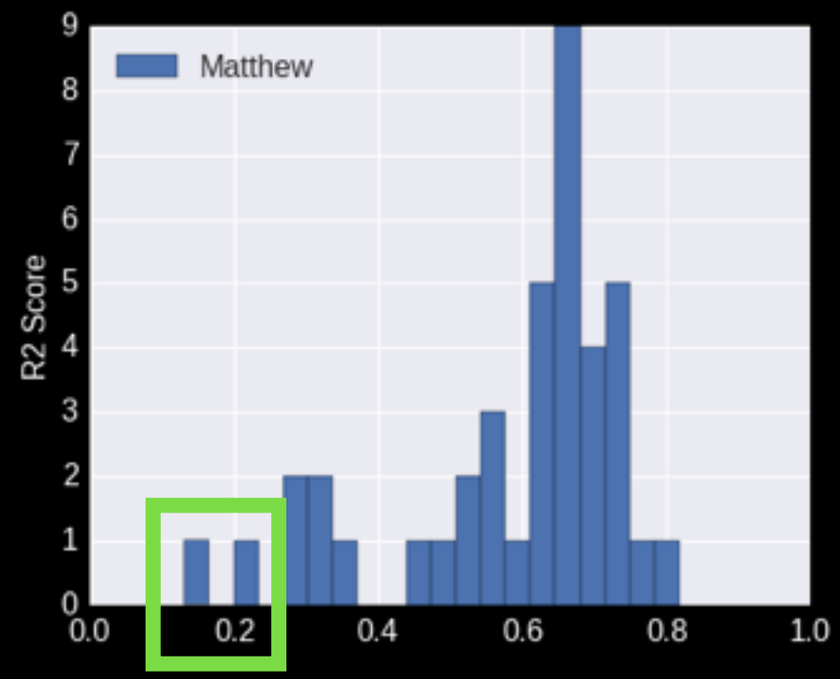
Solution: Predict rider’s performance on any course

Model details

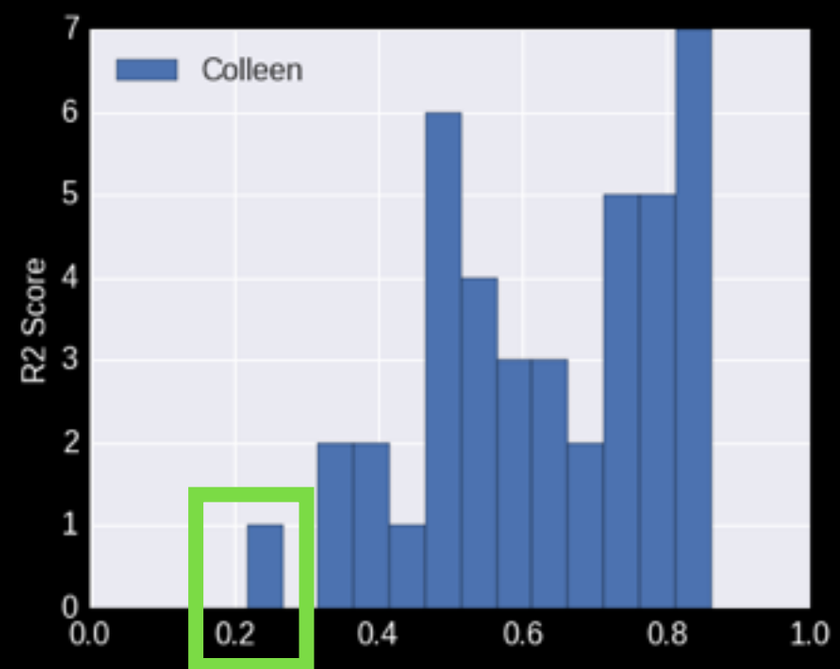


Validation Results





Some users are more predictable than others

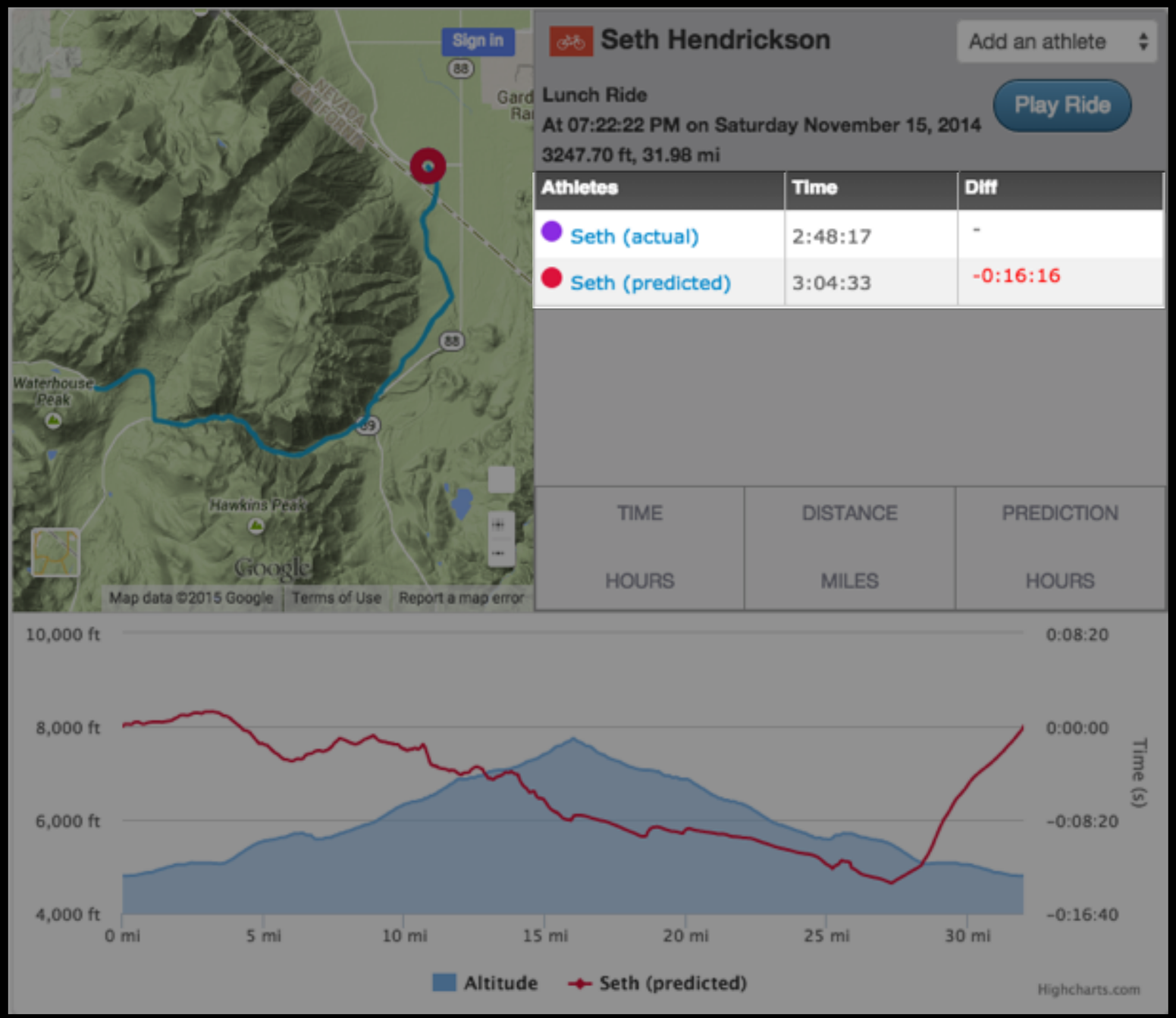


Outliers: what's going on?

- Dirty data
- Uncaptured features

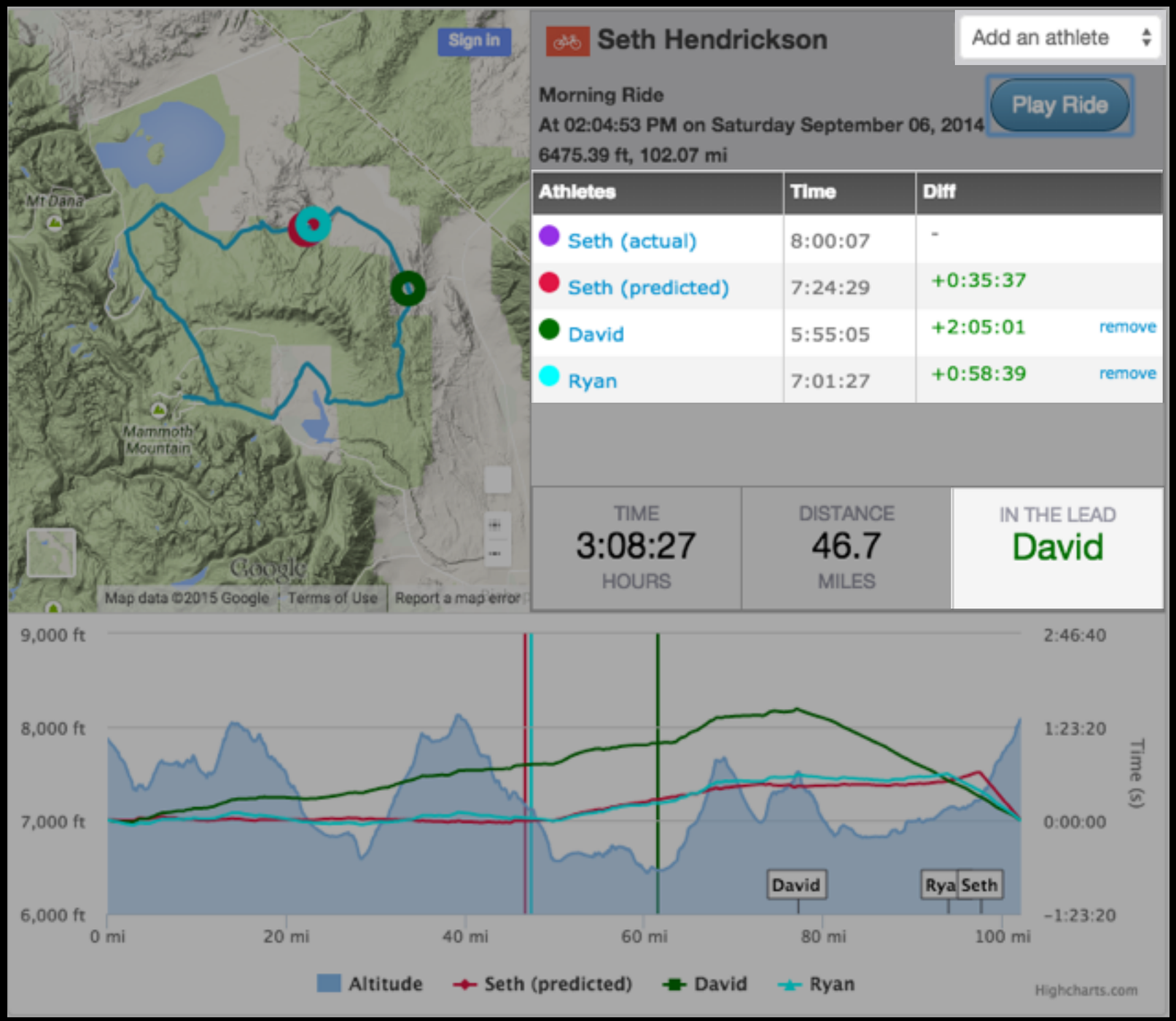
The Results

- A prediction for every course



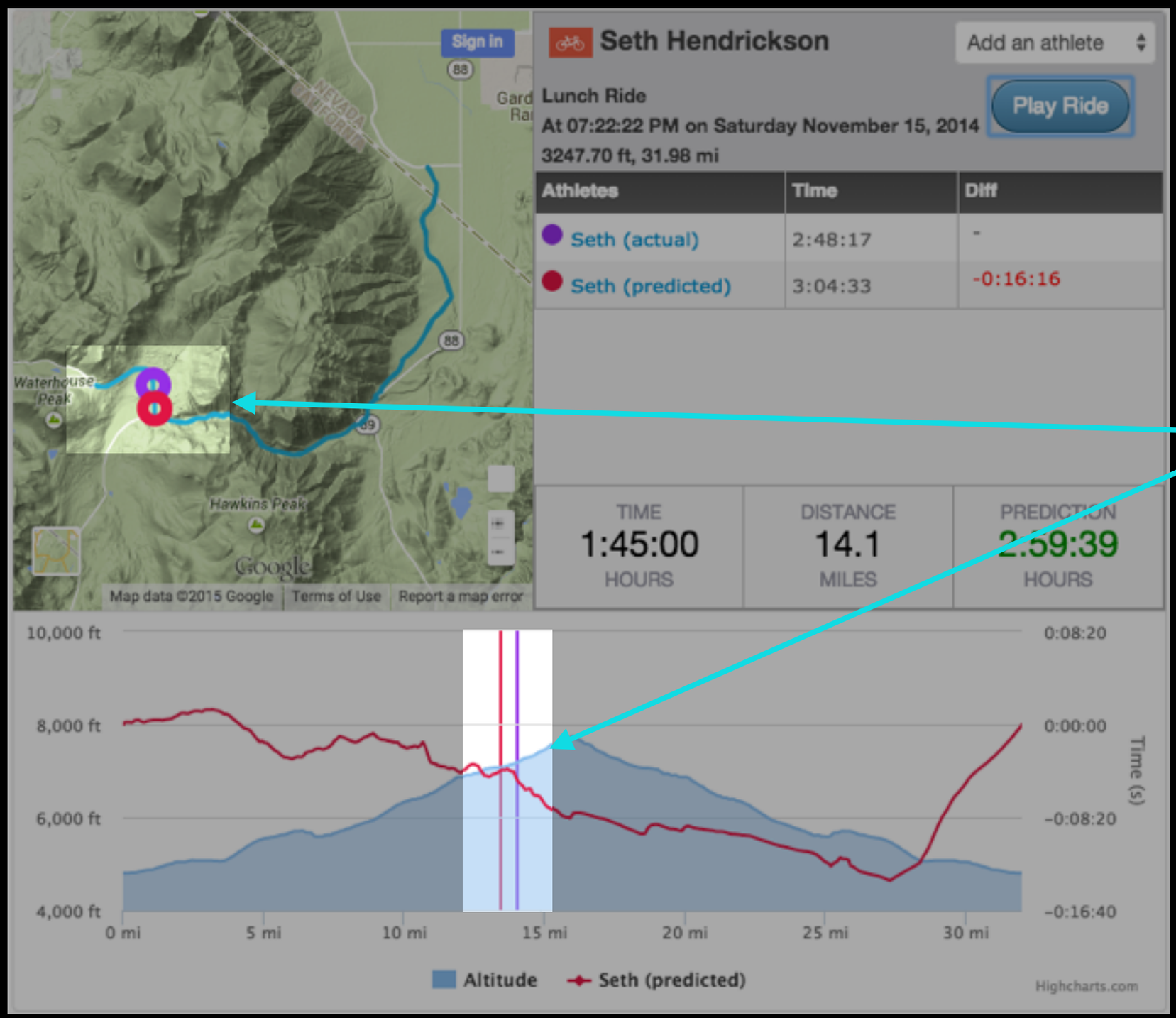
The Results

- Comparisons to any rider, any course, any time



The Results

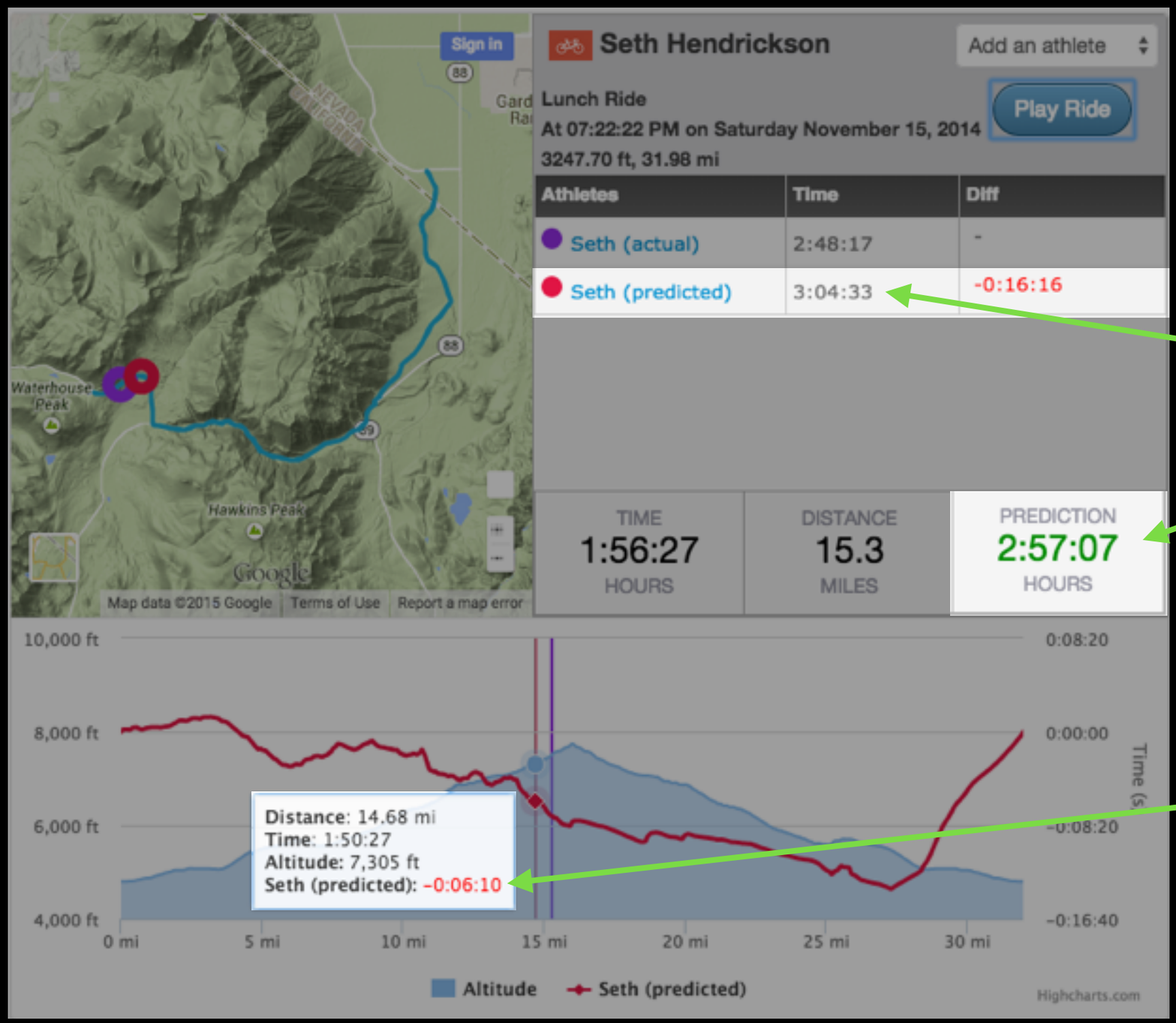
- A ghost to set your pace



Take the guesswork out of pacing.

The Results

- Live, in-ride feedback



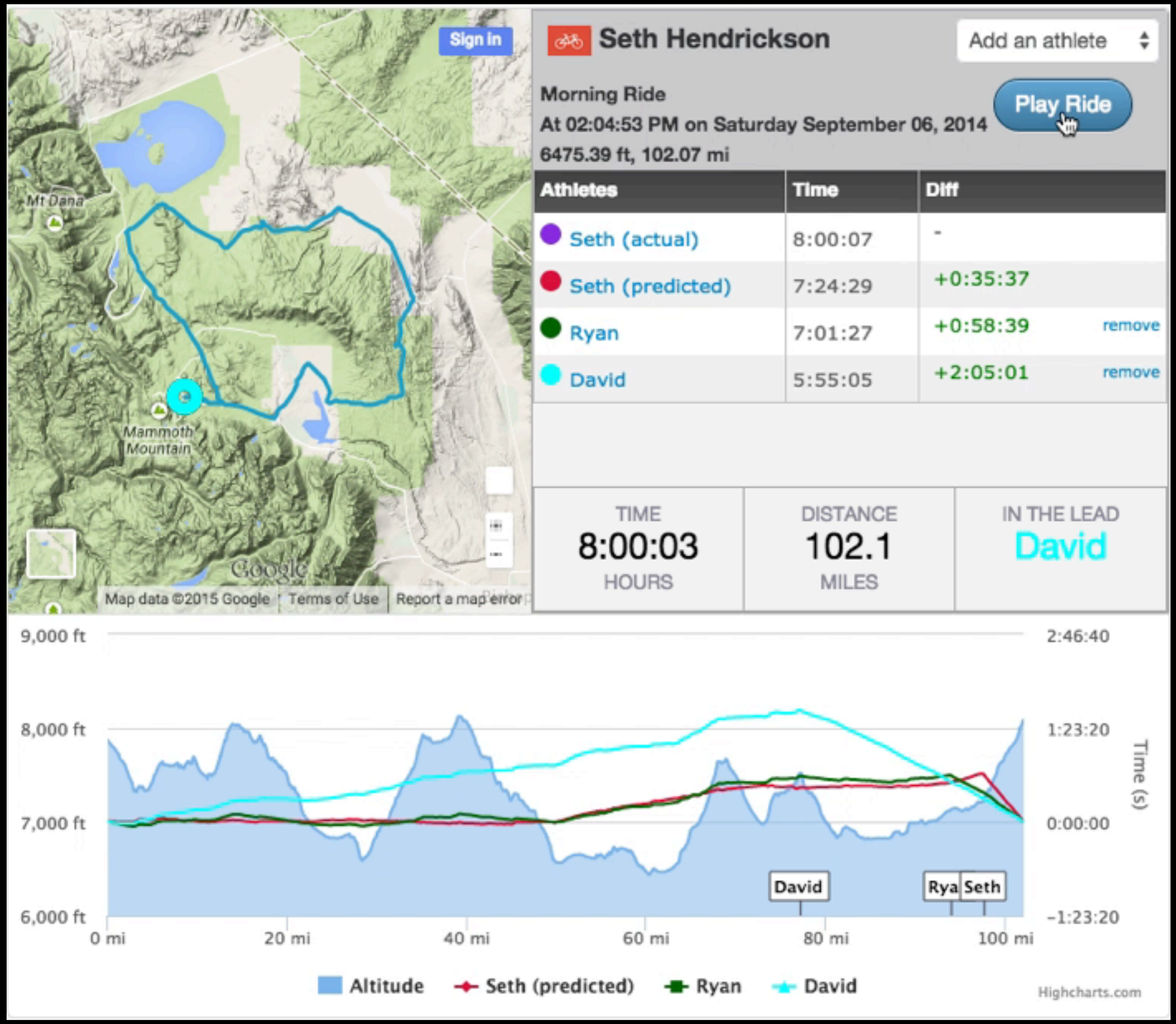
Compare:
original prediction
vs.
updated prediction

Know how much ground you've lost

Next Steps

- More features
  - Weather
  - Rider demographics
  - Traffic
  - Power and heart rate
- Intelligent pacing - you know you’re behind, but where to make up time?
- Automated analysis - highlight highs and lows of ride

Demo

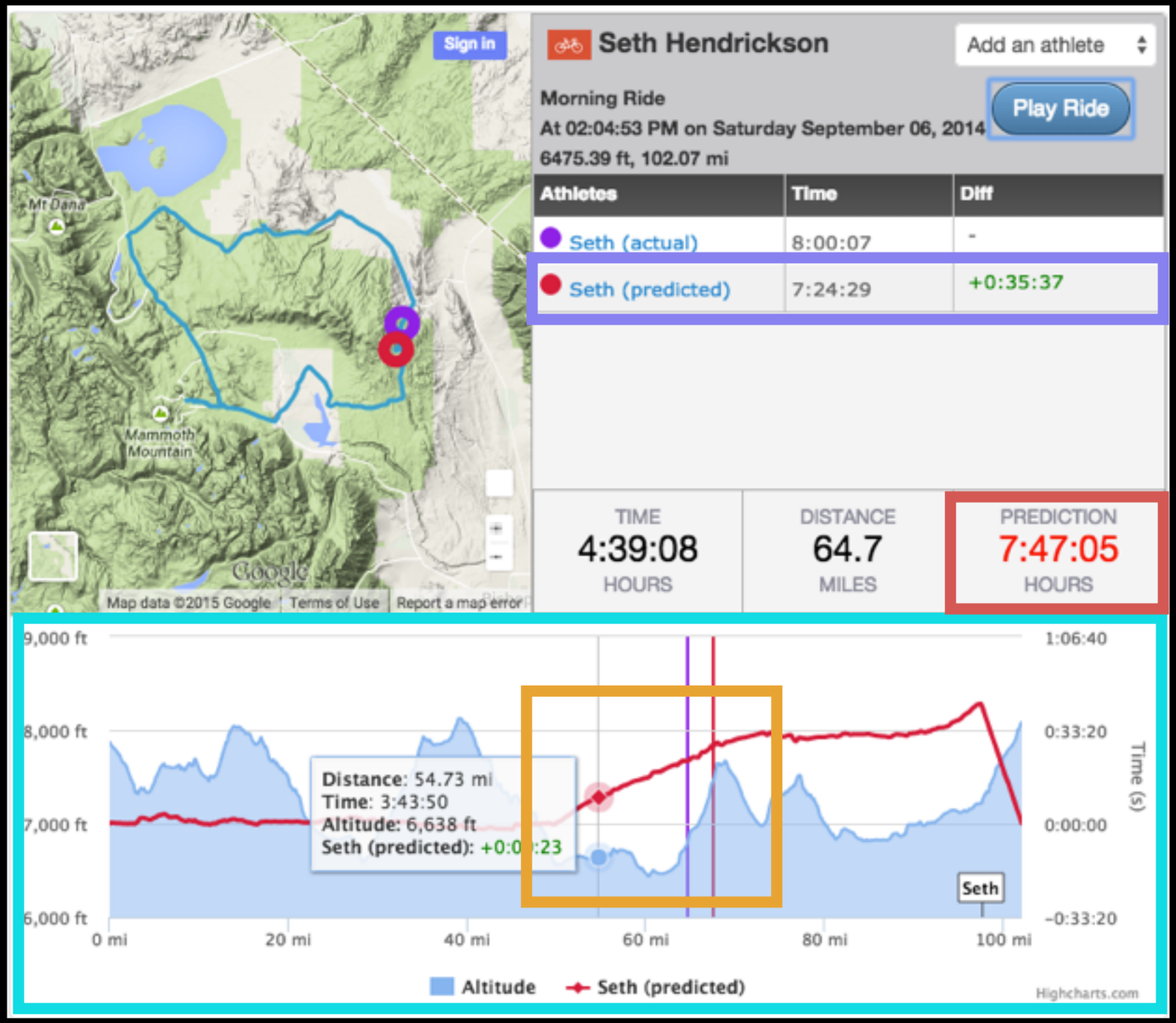

Sign in
Mt Dana
Mammoth Mountain
Google
Map data ©2015 Google
Terms of Use
Report a map error
Seth Hendrickson
Add an athlete
Morning Ride
At 02:04:53 PM on Saturday September 06, 2014
6475.39 ft, 102.07 mi
Play Ride
Athletes
Time
Diff
Seth (actual)
8:00:07
-
Seth (predicted)
7:24:29
+0:35:37
Ryan
7:01:27
+0:58:39
remove
David
5:55:05
+2:05:01
remove
TIME
8:00:03
HOURS
DISTANCE
102.1
MILES
IN THE LEAD
David
9,000 ft
8,000 ft
7,000 ft
6,000 ft
0 mi
20 mi
40 mi
60 mi
80 mi
100 mi
2:46:40
1:23:20
0:00:00
-1:23:20
Time (s)
David
Rya
Seth
Altitude
Seth (predicted)
Ryan
David
Highcharts.com

Questions?

Model details

- Predict the cyclist's velocity at every point (a regression problem)
- A personalized Random Forest Regression model for each user
- Important features
  - Grade
  - Ride difficulty
  - The recent past - window of last n miles of ride
  - Current state - how tired is the rider?
  - Seasonal state - how fit was the rider to begin?

Streaming Prediction



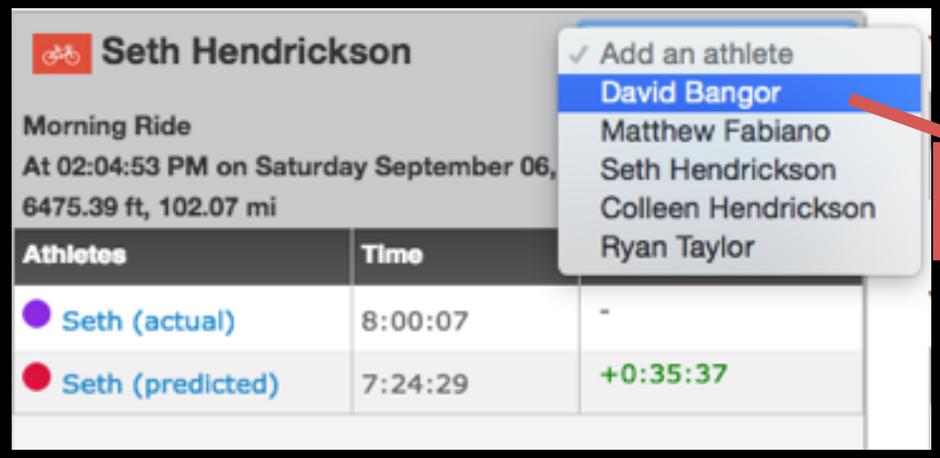
Original prediction helps cyclists plan their rides.

Updated prediction allows riders to intelligently adjust their pace

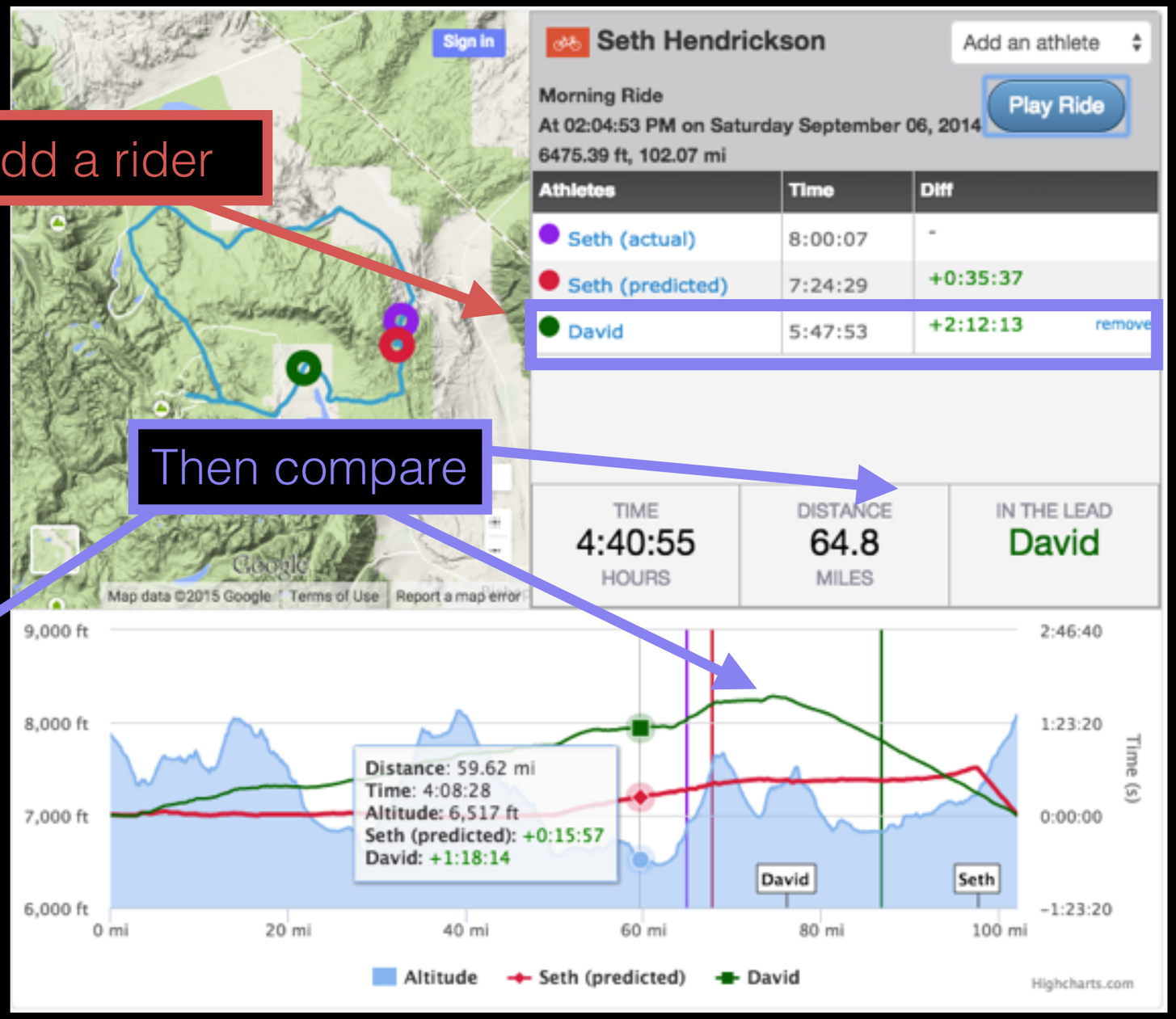
A continuous prediction lets riders see where they will be at every point during the ride

Find out where you lost ground on your rides

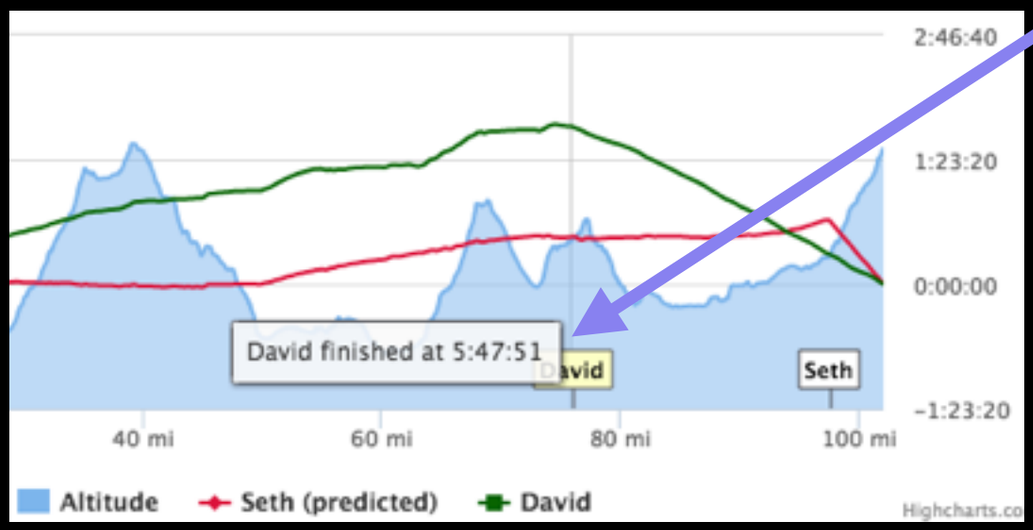
The Dashboard



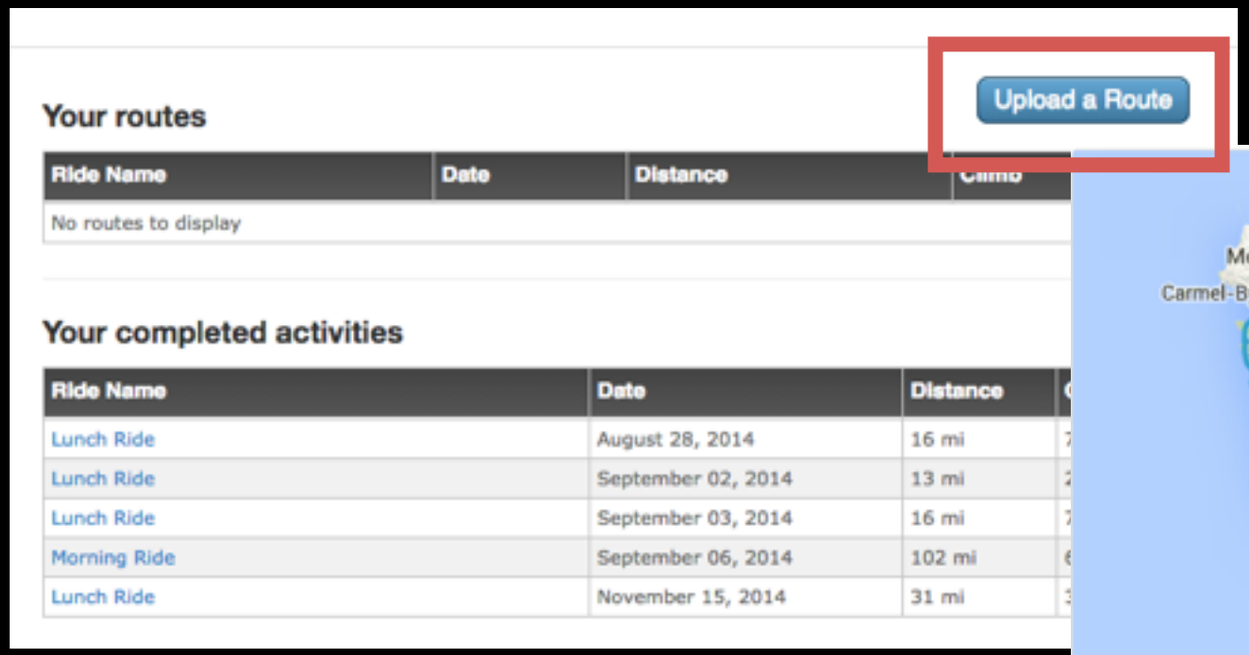
Add a rider



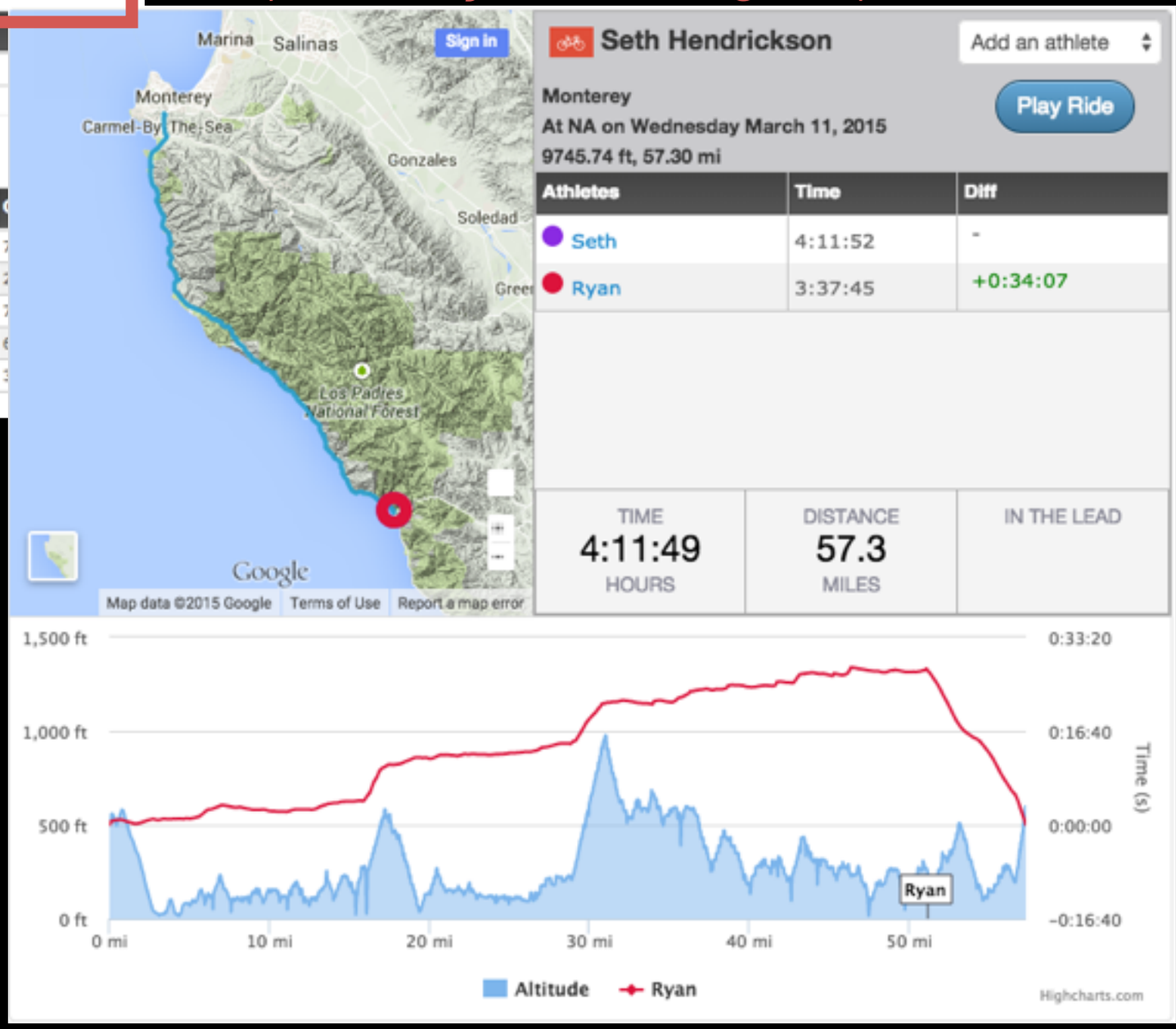
Then compare



Upload new route



Upload ***any*** route and get a prediction



Before you start,

- **Know** how long it will take you
- **Know** where you will be, and when
- **Know** what you're pace should be
- **Get feedback** on your performance as you do it