
sdmay19-37: Are Cross Country Courses Avoiding Hills?

Report 3

February 10th - February 16th

Team Members

Connor Smith — *Ground Truth Engineer*

Thomas Chambers — *Ground Truth Engineer*

Ryan Hilby — *Data Handling Engineer*

Jacob Feldman — *Data Handling Engineer*

David Kirshenbaum — *Data Analysis Engineer*

Andrew Mumm — *Data Analysis Engineer*

Summary of Progress this Report

This past week was highlighted by continued progress on developing hill detection/classification functions and our database setup. The algorithm development team is now poised to tie in the individual classifying tools together into a single function. We now have a functional website interface that is ready to be populated with the results of our algorithm for a given course. We now have the ability to move the Iowa DNR data to our database, and we are continuing to research AWS Lambda as a serverless computing platform along with additional cross country course elevation profiles for testing.

Pending Issues

Our database uploading process works, but it is very time intensive given the sheer size of the elevation files we require from the DNR. Jacob will be focusing this week on accelerating that process. We also need to finalize the scale of our ranking system and choose how it will be calibrated. We previously were thinking of calibrating it with a 10 being the hardest difficulty imaginable, but the results of our algorithm are getting severely skewed with this current approach.

Past Week Accomplishments

- Connor
 - Extracted additional notoriously difficult XC courses' elevation files for testing purposes
 - Tested hill classifying MATLAB functions
 - Fixed energy cost rating function
- Thomas
 - Tweaked rolling hills code and began using ISU courses to calibrate the parameters within it.
 - Attempted contact with more XC officials.
- Ryan
 - Fixed some bugs in large hill detection with help from Connor
- Jacob
 - Wrote a program to automatically upload x,y, z points to our database. It works, but it takes much too long to upload a million points.
- David
 - Scorecard is almost completed. Just some small CSS tweaks are left.
- Andrew

- Researched AWS Lambda

Plans for Upcoming Reporting Period

- Connor
 - Integrate cost rating function with hill classifying functions
 - Develop hardest segment classifier function
 - Determine calibration approach for rating system
- Thomas
 - Have a version of rolling hills detection that can scan ISU courses and produce a result.
 - Work with Ryan to integrate his large hill detection with my code avoiding it.
- Ryan
 - Work with Thomas with integration
 - Fix tolerances with large hill detection
- Jacob
 - Speed up/ parallelize upload of data to database.
- David
 - Add a header to our website to make it look better.
 - Put a map on the scorecard page so you can view your course while viewing its stats.
- Andrew
 - Finalize interop with Lambda and AWS RDS

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Connor Smith	XC course research and function testing/fixing	8	18
Thomas Chambers	Rolling Hills detection	5	13
Ryan Hilby	Large hill detection	5	13
Jacob Feldman	Automated upload of x,y,z points to database.	7	19
David Kirshenbaum	Scorecard page completion	5	16
Andrew Mumm	Lambda Research	2	10