

sdmay19-37: Are Cross Country Courses Avoiding Hills?

Week 6 Report

October 21 - October 27

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 reporting period was mainly devoted to software development and continued research into sources of historical cross country course routes. On the software side, we focused on some new experimentation with R as well as server communication between our Google Maps mapping tool. We also gave one last-ditch effort at communicating with our differential GPS unit to no avail. We also initiated contact with NCAA and IAHSAA cross country officials regarding historical course information, but more follow-up with said officials is needed to be useful.

Pending Issues

We were unable to get the Promark2 differential GPS unit functional and have decided to no longer use it in our in situ elevation studies. We feel that this is a fair decision because the device itself is of very limited value in forested areas (like many XC courses) and is of prohibitive cost to ever be implemented in the final version of the product.

Past Week Accomplishments

- Connor
 - Read various journal publications regarding quantifying elevation gain and the effects on pacing
 - Researched various ways of classifying different elevation gain types
 - Gathered information on cross country courses that have changed routes in their history
 - Corresponded with NCAA XC Media & Statistics Coordinator and Iowa High School Athletic Association's president regarding availability of historical course information for analysis purposes
- Thomas
 - Attempted final solution with ProMark2.
 - Experimentation with R Shiny.
- Ryan
 - Did not get much done. A few experiments with R.
- Jacob
 - Attempted to set up a simple server to combine the work that David and I have been doing the last couple weeks together with David. That is, getting the elevation data of a line drawn in Google Maps.
- David
 - Worked on trying to set up a simple server so our front end Javascript and back end R script can work together.
- Andrew

- Tried to setup a basic server to connect the html and javascript from David's mapping tool to an R script. Was able to somewhat succeed with R shiny.

Plans for Upcoming Reporting Period

- Connor
 - Conduct survey of ISU XC course
 - Conduct geodetic point loop survey
 - Further research calculations for hill classification
 - Experiment with applying different filters to phone data and evaluating its subsequent validity as an XY datasource
- Thomas
 - Perform more GPS surveys.
- Ryan
 - Work with GDAL.
- Jacob
 - Work with Andrew and David to set up front end and back end boilerplate code so that we can begin working separately to build our web app.
- David
 - Work to get server space, most likely hosted in the cloud, and try to get it set up for our course analysis.
- Andrew
 - Find a better way of hosting and connecting an R script with HTML and javascript because R shiny is not very flexible and scalable. Looking into GeoPython - AutoGIS to use instead of R.
- All
 - Meet with former ISU track and XC coach Bill Bergan to receive his input on our project

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Connor Smith	Elevation gain calculation research, communication with XC officials, and research of historical XC course routes	8	40.5
Thomas Chambers	Contacted Dr. Kaleita for ProMark2 assistance. R Shiny research and tutorial.	3	27.5
Ryan Hilby	Experimented with R	1	22
Jacob Feldman	Attempted to set up a simple server to combine the work that David and I have been doing the last couple weeks together with David. That is, getting the elevation data of a line drawn in Google Maps.	6	29.5
David Kirshenbaum	Attempted to set up a simple server for a demo. Combining the R script and the front	5	25

	end javascript and HTML, but was struggling a bit.		
Andrew Mumm	Connecting R scripts to JavaScript and HTML	6	22

Gitlab Activity Summary

Nothing to report.
