FIRST NAME: Tyler

LAST NAME: Tucker

RedID number: 809996103

Degree: MS Math,

Thesis title: Mathematics and big data technology development to visualize, deliver and analyze IMS and ARGO data

Abstract:

This research addresses current trends in big data, and how to apply them to mathematical, statistical, and climate science applications. The first half of the thesis describes a toolkit for snow-cover area calculation and display based on the Interactive Multi-sensor Snow and Ice Mapping System (IMS). The paper uses the Tibetan Plateau region as an example to describe the toolkit’s method, results, and usage. The toolkit is available as an open source Python software on GitHub.

The second portion of this thesis extends the idea of a toolkit into a fully fledged web app for the Argo dataset. The Argo program has generated close to two million temperature, salinity, and pressure (T/S/P) profiles in the upper 2000 meters of the ocean. A new web app named Argovis at www.argovis.com provides easy access to Argo profile data and gridded products for both scientists and the general public. The RESTful application allows users or even other apps to interact with a database through the URL.

The topics covered in this thesis entail big data sets and how to visualize and retrieve data quickly. The issues posed in this thesis extend past 3D/4D climate data sets. Open source toolkits and web apps for data visualization and accessibility pertain big data sets in general.

Thesis Committee

Chair, Sam Shen, Mathematics

2nd Member, Barbara Bailey, Statistics

3rd Member, Fernando De Sales, Geography

Your phone number (required): 408-834-5592

Thesis date/time:TUES., APRIL 24, 10:00-11:00 am (reserved for one hour only)

Room: GMCS 418

*Requesting 15 minutes to check projector compatibility with my Linux PC.*