Page 2 - Faculty Sponsor(s) asks for information about your faculty sponsors. At least one faculty supervisor/mentor is required for all submissions to the Symposium. You'll need to enter the name, department and contact info for each sponsor. Here is where you can also include graduate collaborators who worked on the project.

Faculty Advisor: Dr. Jeffrey Miller

Department: USC Viterbi Department of Computer Science

Contact: jeffrey.miller@usc.edu

Page 3 - Submission Details asks for information about the work you are entering. You'll need to enter the following items:

● Title and category

**Computer Science in Our Public Schools: A Study of Los Angeles County**

Category: Physical Sciences, Math & Engineering

● Short description (max 50 words)

To investigate the local population of grade school students studying Computer Science, government data was consolidated into an online interface. This tool allows us to visualize the impact select demographics (e.g. ethnicity, income) have on Computer Science participation. Our website generates charts for combinations of variables selected by the user.

● Abstract (max 300 words)

The purpose of this study is to gain empirical insight into the state of Computer Science (CS) in grade schools proximate to USC. Using available records from the California Department of Education, three decades of Los Angeles County public school data was compiled into meaningful tables. This data provides explicit CS enrollment totals; for any CS course, specifying a school, grade level, gender, and ethnicity will give a precise student count. Further, the percent of students that qualified for Free or Reduced Price Meals (FRPM) at each school was used to estimate the average income level of that school’s student body.

Naturally, we hypothesized that schools with a high minority population and low income students would be less likely to offer CS. If these schools did offer CS, we hypothesized that they would have fewer CS enrollments compared to their majority-populated, higher income counterparts. To test these assumptions, we built a website with a data visualization tool, which streamlines the data manipulation process by generating charts for desired pairs of parameters. Users need only select the x-axis they wish to plot against (e.g. time, income) and the specific demographics for which they want enrollment information (e.g. 12th grade female Hispanics).

The charts produced allow us to determine which demographic categories are more or less predisposed to participate in CS. Understanding this relationship is key if we are to target and grow underrepresented categories. We continue our analysis, but hope that others may use our interface to research their own hypotheses and that the results our investigation has illuminated will allow policy-makers to more effectively strategize ways to encourage participation across schools and students of all backgrounds.

● Main issue or questions addressed by your work

To what extent, if at all, does being a member of a disadvantaged demographic limit Computer Science participation by schools and students?

● Individual contributions to the work

I sought out data from an array of sources, and then used a statistical computer language to compile all the records into logical tables and stored them in a database. To help with the data visualization and to encourage participation in the project, I created a website that rendered the desired charts using scripts that queried the database. Dr. Miller and I then analyzed the resulting figures and composed a research paper with our conclusions.

● Learning outcomes (skills or knowledge you developed through this work)

Online data collection

Web scraping, web crawling

Statistical computing and data analysis

Database management

PHP data querying

Dynamic web development, responsive design

Synthesis of academic papers for publication and conference submissions

Page 4 - Project Needs asks for information about logistical needs to present your work. For example, do you need an electrical outlet for a laptop to display a website or video? Let us know in this section.

Preferably a screen for displaying our website.

Fine grain

To realize the [wider/ultimate] [pattern/broader picture]

Micro-level

County Macro scale

The comparisons

Query

The charts produced allow one to [realize/extrapolate] the [big picture] \_\_\_ .