

Computational-aided Poster Design Assessment to Facilitate Science Communication

Camilo Pareja, Class of 2022

In my research, I set out to develop a program that could take in scientific research posters made with PowerPoint and automatically edit and optimize them. These optimizations would enhance legibility and organization, as well as overall aesthetic. In use, this program would be able to help students and researchers alike with their poster projects. The program would also be integrated into a website for public availability and ease of use. My teammate, Michelle Luan, worked to create a website, which provides a comprehensive, intuitive user interface and experience for the program.

To begin, I searched for examples of real research posters online. These posters, along with existing guides, helped me to list all the common qualities seen on legible, neat scientific posters. Using the Python coding language, I was able to first write two sets of code which generated brand new research posters as PowerPoint files. Each program used our poster guidelines to create and save either an example of good or poor poster design. After using code to create every single element of the poster (without ever needing to open Microsoft PowerPoint, Google Slides, or a similar application), I was better able to pinpoint what parts of the code led to good design qualities in the poster versus aspects that could use improvement.

Next, I set out to write an analyzer program which could open and provide feedback on a given poster file. The analyzer program uses the list of qualities we initially outlined, such that it can detect when an existing poster is doing something right or could use improvement. When this program is finished running, the user ends up with a comprehensive list of things they did well with the poster design and areas that require a second look. This program works with a focus on readability rather than content, since researchers often set out to accomplish different goals with the content of their posters. Thus, the program can be used by anyone for a variety of research posters, professional and casual alike.

After that, I began writing a fourth program which would edit an existing poster file and save it as a new and improved poster for the user. This final transformer program looks at and provides feedback for the existing poster just like the analyzer program, while simultaneously fixing any common features of poor design it may detect. When finished running, the program saves the edited version of the poster as a separate file for the user. This way, the user can compare the original and new files. This final program was then integrated into Michelle's code which uses HTML, JavaScript, and CSS coding languages to operate the website.

In the future, I'd like to refine and expand the kinds of qualities which the transformer program can analyze and edit. Also, while working on the main project, I had begun writing another program which automatically generates a customized research poster file for the user. This program works by intelligently fitting a user's text content into a premade poster template. Further development of this program could also become part of future research in this topic.

Faculty Mentor: Prof. Sarah Harmon

Funded by the James Stacy Coles Summer Research Fellowship