

Customizable and Intuitive Visualizations for Complex Data



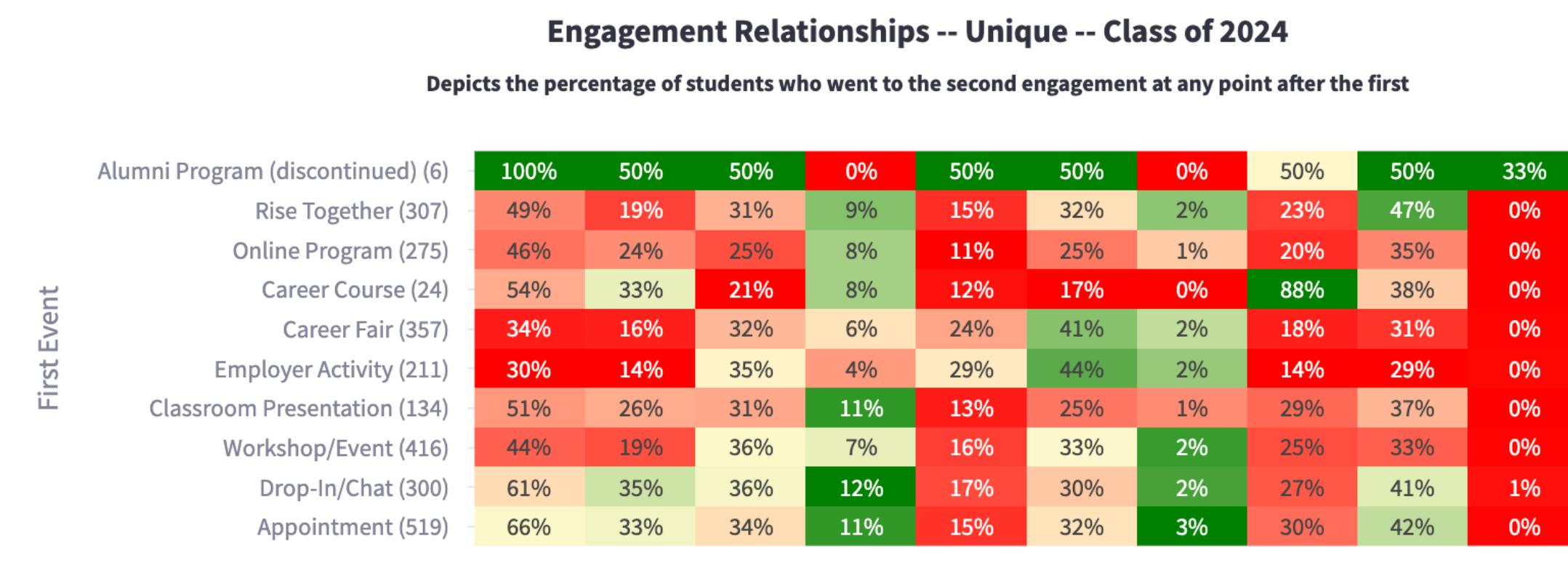
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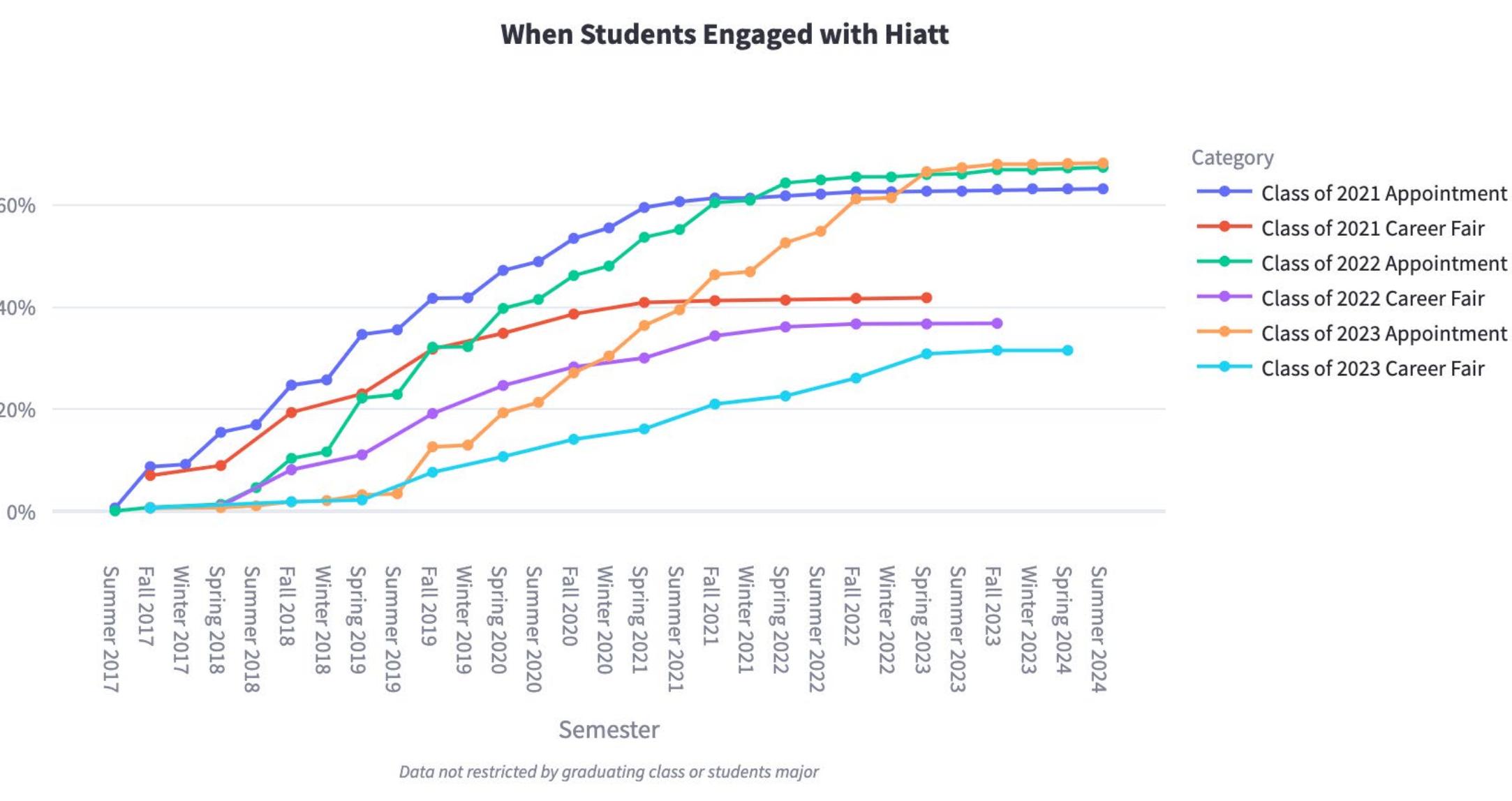
Abstract

This work was completed through the Data Science Internal Internship (DSII), geared towards making operational impact for the Hiatt Career Center. This project evolved into a visualization dashboard that leveraged the power of Python code libraries, while being designed for a nontechnical user and audience. This required a design that was easy to use but could contain complex information about a nuanced topic.



Motivation

- Originally designed for Hiatt, attempting to better understand student engagement over time
- Hiatt leadership wanted the ability to understand longitudinal trends in data, within a complex dataset with many important facets while not having the background to directly use coding tools
- The project was restricted by finding the balance between a more technical and informative visualization, versus a simpler graphic that was more easily understandable to the user



Work and Development Outcomes

Intuitive Data Encodings

One critical finding was that certain encodings are intuitive to users, like green being a good trait or feature. These encodings do not need to be taught and are easily interpreted. This led to a slightly contradictory secondary finding: when creating graphs that looked similar, visual contrast was needed to differentiate between different graphs when there were different meanings behind the encodings.

Hiatt Career Center -- Advanced Visualization Creator

Created By: Rowan Scassellati and Jon Schlesinger

What type of visualizations should be generated?

Choose an option

Show ways to restrict the data, which applies to all graphs

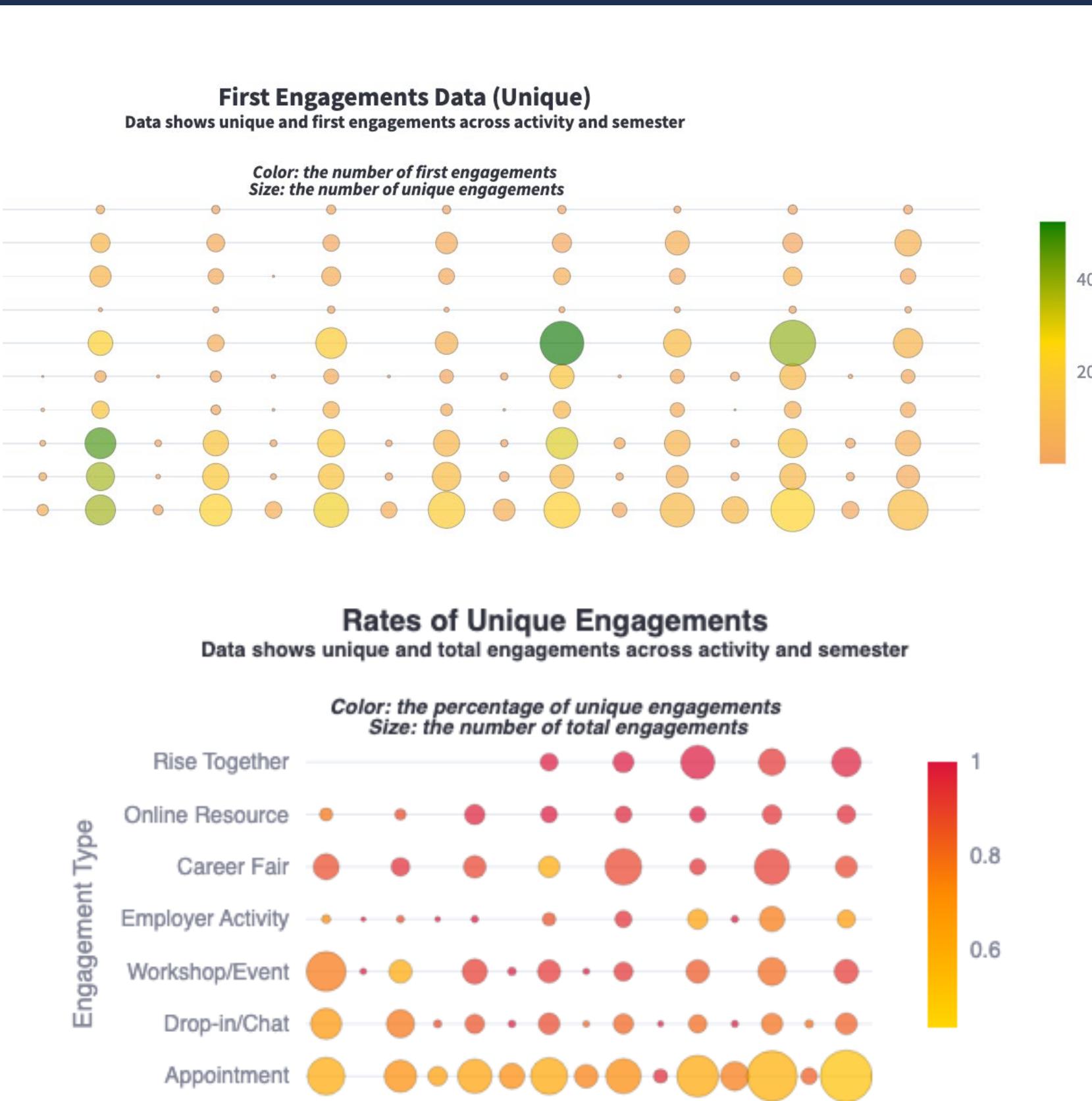
Show fine tuning options for the scatter plots

Show fine tuning options for the sankey diagram

Other options

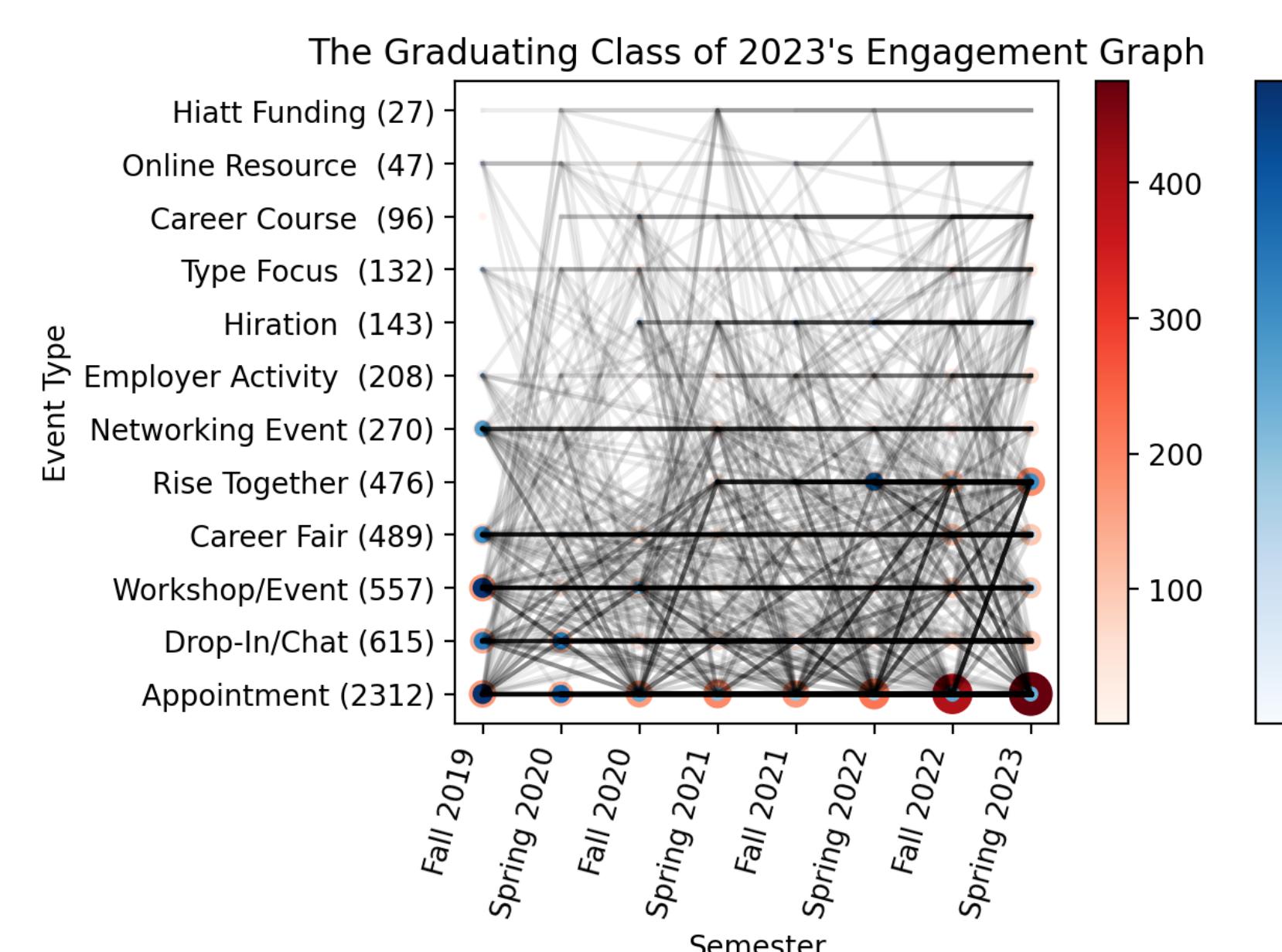
Dashboard Suite

Even with the other tools mentioned, for a complex situation like graphing thousands of interactions of a diverse group of students, the useful information won't be fully encompassed in one chart or graph. Instead of attempting to find one solution, a dashboard with many different graphs and visualizations provides a more holistic perspective through many different more specific and digestible snapshots.

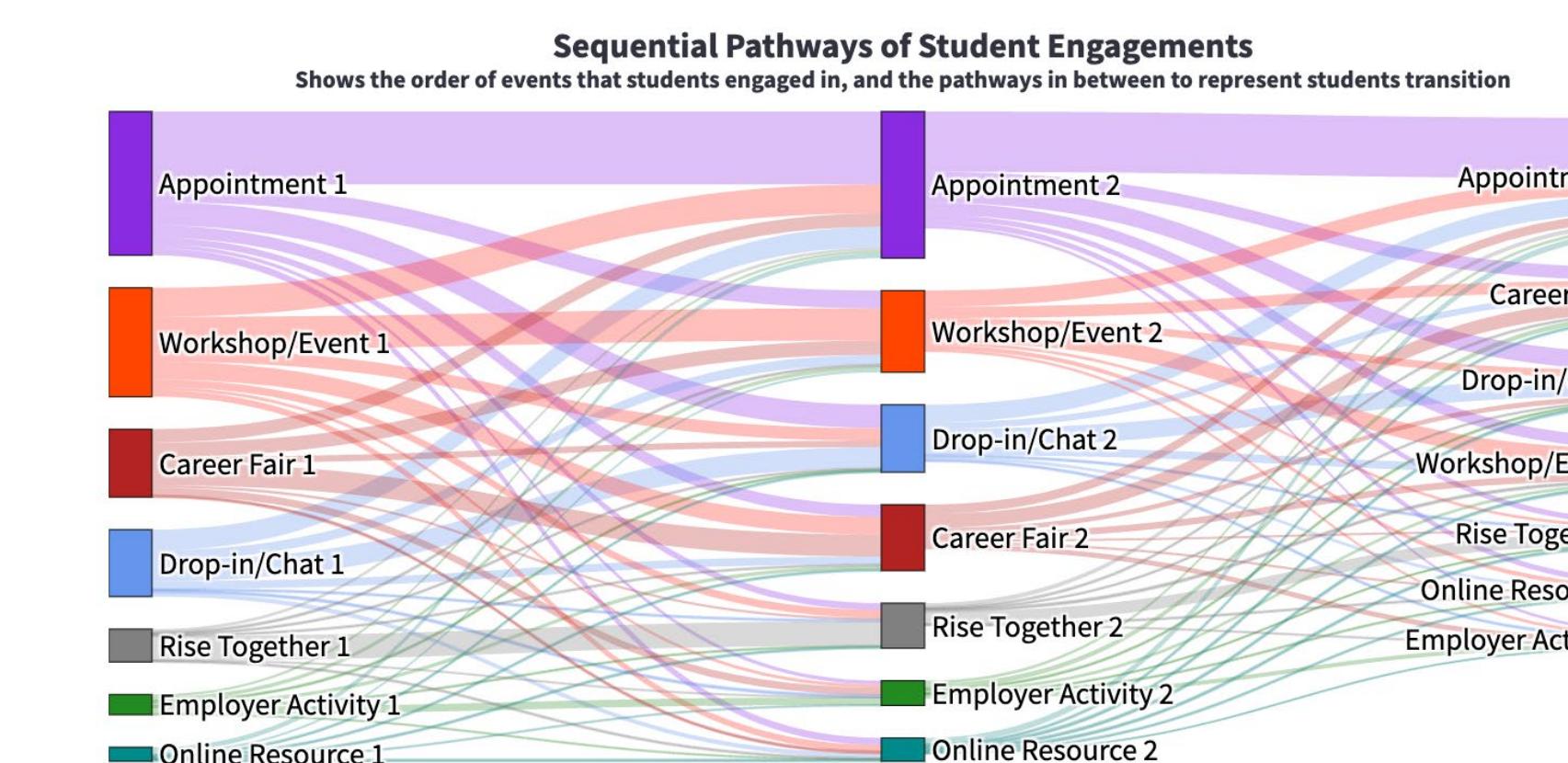


Filtering and Interactivity

Keeping with the desire to maintain a visually minimal graphic whenever possible, a lot of work went into incorporating additional information within layers that could be toggled by the user, rather than showing all of the information at once. The ability to find additional information or restrict to key demographics or fields allows each visualization to serve as a summary that can be investigated further.



- Developed a practical and effective website that serves as a dashboard to create, explore, and compare custom visualizations
- Creating a suite of visualizations with smart encodings allowed for easy interpretation
- To further develop this concept, one could explore other methods of analyzing the data by using different calculations/aggregates of the data



Conclusions

When handling a complex dataset with a multitude of potential insights, it is natural to attempt to extract as much information as possible for potential users. In certain environments where sufficient training or introduction is available, these highly developed visualizations can be ideal. But in a broader context, where user time is limited and valuable, conscious planning of visualization design can be the difference between an effective graphic that produces understandable insights and a tool that is left unused.

Acknowledgments

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