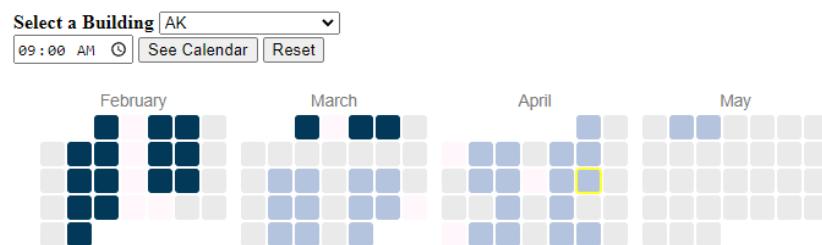
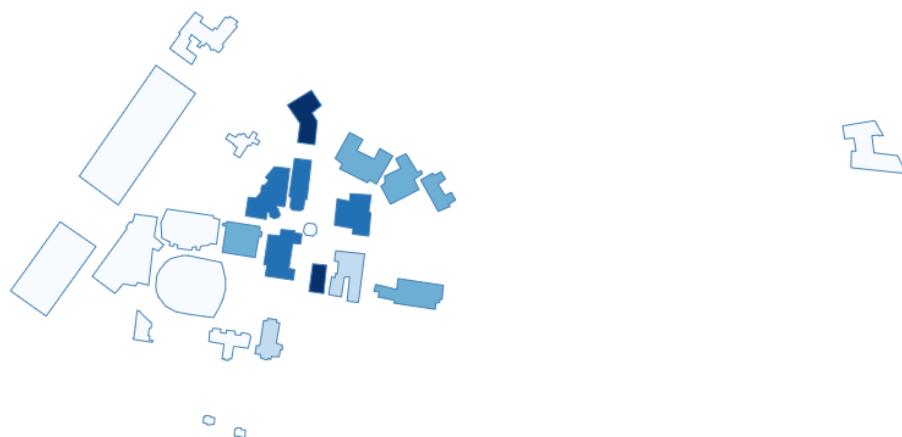


25Live Interactive Calendar and Map: Process Book



Showing events on 4/15/2022 with a 9:00 AM start time



CS480X Data Visualization Final Project

Authored by:

Carley Gilmore

Justin Moy

Amos Roche

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Initial Project Proposal

[entry by Carley Gilmore, 02.17]

In class, our team came up with three different project proposals and submitted them to Prof. Harrison via a Google Form. Here are the three ideas we came up with from our meeting notes:

1. WPI map showing volume/traffic density on campus throughout the day
 - a. Manually track data
 - b. RFID data if possible
 - c. WPI Planner information on available seats
 - d. Cell phone Wifi Data- strength signals: netOPS
 - e. Look at sports practice at rec center
 - f. 25live
2. Comparing volume of people at the CC before COVID and now
 - a. Goal: convince WPI to keep the CC open later
 - b. Means of getting data on activities- SAO in the CC
 - c. Obtain info on hours students can still swipe in
 - i. Are students still going to late night events even if the dining hall closes 2 hours earlier- is there a lessened incentive to go to the CC based on this.
 - d. Data visualization- heat map over cc: cumulative volume- how long are people in CC
3. Calendar has the events of the cc at different times- planner.wpi.edu data where classes are- select on the site your classes and see the volume at the cc
 - a. Looking at peaks of activity or lack thereof in CC- to encourage people to go and what times work best for regular attendees

Feedback on Initial Proposal

[entry by Carley Gilmore, 02.20]

Today, Prof. Harrison reached out to us with feedback regarding the three project proposal ideas that we came up with in our last meeting. The feedback is as follows:

Traffic Map of Density on Campus Daily

This is a really cool idea space. If you're already asking around for data, you're doing it right! Be sure to plan time for making the map as a baseline, so you can find time to debug and add heatmaps on it. (Note: I recognize that some of the ideas from this team are similar, so feel free to combine feedback.)

Volume in Campus Center Pre-COVID vs Now

Love this idea. Vis for student advocacy! I'm not sure how hard it will be to get pre-COVID data. You can get data now on your own. Here's a thought: combine your tracking of people with a survey initiative, asking about CC staying open and how it will help. That combo will make a compelling case.

Interactive Calendar of Event Turnout

If you can find the data, this project is achievable for sure. There are some nice visualization research papers about calendar-oriented data, and plenty of d3 examples out there. SAO could also be a good "client" for design achievement focused activities.

Project Decision Rationale and Action Plan

[entry by Carley Gilmore, 02.21]

Today, our team met in class to discuss Prof. Harrison's feedback on each of our project proposals. Based on the response and feasibility of each idea, our team decided to work on the "Interactive Calendar of Event Turnout." We came to this conclusion after discussing that the 25live data would be relatively simple to obtain from the 25live administrator and would be accurate data based on planned events.

We decided that the "Traffic Map of Density on Campus Daily" project data would be hard to obtain, and there was no guarantee that we would be able to have details on Unity Hall on the expected foot traffic and how that has developed. We might have had to resort to collecting the data manually, which was impractical given the time frame of our project.

For the "Volume in Campus Center vs PreCOVID vs Now" project, one of the teammates also expressed that the reasons for the CC closing sooner has to do with dining services being understaffed. The team also came to the conclusion that the data collected on meal swipes would be difficult to correlate to event attendance. Obtaining card swipe and event attendee information pre and post COVID hours would be difficult since not all events track attendees. It would have been unclear whether or not students are staying in the CC to attend an event or engaging in unrelated activities like studying.

Overall, "Interactive Calendar of Event Turnout" was the project that our team was most interested in pursuing. The idea of coloring buildings based on the concentration of events in different hours of the day was appealing to us. We also liked the idea of a calendar that could communicate to students the types of events that are being hosted each month of the year and in which buildings. We also liked having the d3 calendar and map being populated with data and in sync with user input as standalone and interrelated components.

At the end of this meeting, our team made a general action plan for which teammates will work on researching and implementing each component. The action plan is as follows:

Email SAO for administrator approval of Report data- Justin

Map of Campus- Carley

- Lighting up different buildings based on 25Live data on events

Calendar- Amos

- Interactivity
 - Giving more information about the day's activities

- Giving a summary
- Allow to scroll through different months

Event Literacy for 25Live Survey - Justin

Syncing Both Components Together- full team

Lastly, our team set up a git repository for version control on our project and pushing code-related changes.

Overview and Motivation

[entry by Carley Gilmore, 02.21]

The goal of this data visualization is to display event happenings booked in 25Live in an interactive, useful manner. We want it to be apparent to students that there are events happening on campus. What better way to express this than an interactive student map and

calendar? Students who use our data visualization are students who want to see how active campus is in events. They will be expressing an interest in attending events by filling out the input on our page and viewing, clearly on our calendar, which days there are events in a specified building.

The problem that our team recognized is that there are many events, but the ways in which this is communicated to students are limited. In the 25Live portal, students looking for events have to know the name of the event and/or the event location to find events. This is a pretty daunting task, and usually the users of 25Live are student leaders/organizers of the events themselves who are booking events. The main problem: people don't know how to find events, and the only place where all the events are in a centralized location is 25Live. However, 25Live is not well equipped to communicate/advertise the events themselves. This is a huge problem because 25Live has the most accurate, up-to-date information on event happenings on campus. Students often have to find out about 25Live events through word of mouth, posters, emails, TechSync, and other avenues. Our team reflected on the question: What if we had a way for students to visualize all of the relevant social events happening on campus? This question is the motivation of our data visualization final project. We identified a clear need and mutually agreed that at times it's hard to get a sense of what events are happening on campus.

Our initial overview of the project was something similar to a heat map projected over a map of campus to see what the hot spots are for events at different dates and times. When the user indicates a date and time they will clearly see buildings light up accordingly. In a similar fashion, when a user specifies a building, date, and time, a calendar will appear with dates that are indicative of the events happening at a specific building. The map will change with the selection and the other buildings on campus. A student can click on a date to see a list of the events happening, where in a building they are happening, and other important details. We hope that this visualization allows students to effectively take the temperature of campus events on different days. With a clear map and calendar, students can find up-to-date events that they would want to take part in. Most importantly, they will feel a sense of school spirit and desire to participate based on the map iterations they view indicating a presence of event activity.

Requesting 25Live Data

[entry by Justin Moy, 02.21]

Today, I emailed Amy L'Heureux from the Events Office to request 25Live data for our project as shown below.

On Feb 21, 2022, at 3:32 PM, Moy, Justin K.<jmmoy@wpi.edu> wrote:

Subject: RE: 25live Data Access for Data Visualization Class Project

Dear Amy,

It's been a while since we last spoke, but I hope you are doing well.

My data vis class group members and I were interested if we could get a file containing all 25live bookings present in the system. Essentially, we would need location, date, event type, and times. We plan to create an interactive map and calendar where you can see events happening in buildings.

Is a report like this doable to get, or are there other backend ways to connect to 25live if not?

Thank you!

Sincerely,

Justin Moy

Amy responded right away and connected us with Hannah Poirier, the 25Live software administrator, and I gave her a summary of the data we are requesting.

From: L'Heureux, Amy J. <ajlheureux@wpi.edu>

Hi Justin!

It's great to hear from you. I'm doing well, how have you been?

That sounds like a really cool idea for a project. I am going to connect you with Hannah Poirier, our 25Live software administrator. She is fantastic, and extremely knowledgeable!

Thanks,

Amy

Amy L'Heureux
Events Office
Worcester Polytechnic Institute

My response is as follows:

From: Moy, Justin K. <jmmoy@wpi.edu>

Thanks for connecting us!

Hi Hannah,

To sum up the previous emails: Essentially, we would need location, date, event type, and times. We plan to create an interactive map and calendar where you can see events happening in buildings.

Is a report or csv like this doable to get, or are there other backend ways to connect to 25live if not?

Thank you for your help!

Sincerely,
Justin Moy

We are hoping to hear back from Hannah soon, as this data is crucial for producing our data visualizations.

Update on Obtaining 25Live Data

[entry by Justin Moy, 02.22]

Today, Hannah responded to our request in the email below:

From: Poirier, Hannah <hpoirier@wpi.edu>

Hi Justin,

This is really interesting, thanks for reaching out! Let me work up some information and documentation so that you can have a good basis for what we can do, and then we can go from there. It will probably take me about a week, if that's okay.

Thanks!

Hannah Poirier

Systems and Events Scheduling Administrator
Events Office

We asked if we could get the 25Live data by Friday, February 25th:

From: Moy, Justin K. <jmmoy@wpi.edu>

Hi Hannah,

Our project is due on March 3rd, so we have a very short timeline. Is there a possibility we can get the data by this Friday 2/25?

Thank you and sorry for the short timeline.

Sincerely,
Justin Moy

25Live CSV Data Obtained

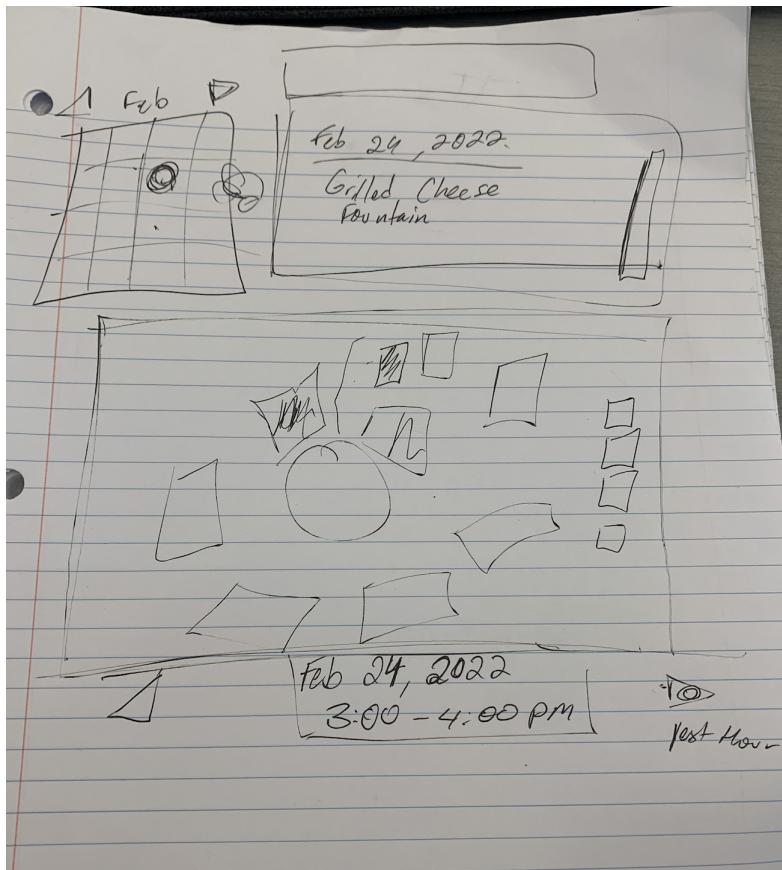
[entry by Justin Moy, 02.24]

Conveniently, before our scheduled team meeting, Hannah reached out and sent us the 25Live CSV data. The data ranges from February 1st to May 3rd and includes analytics such as Event Name, Organization, Start Time, End Time, Expected Head Count, Building, etc. We have all of the fields we requested to use for our data visualizations.

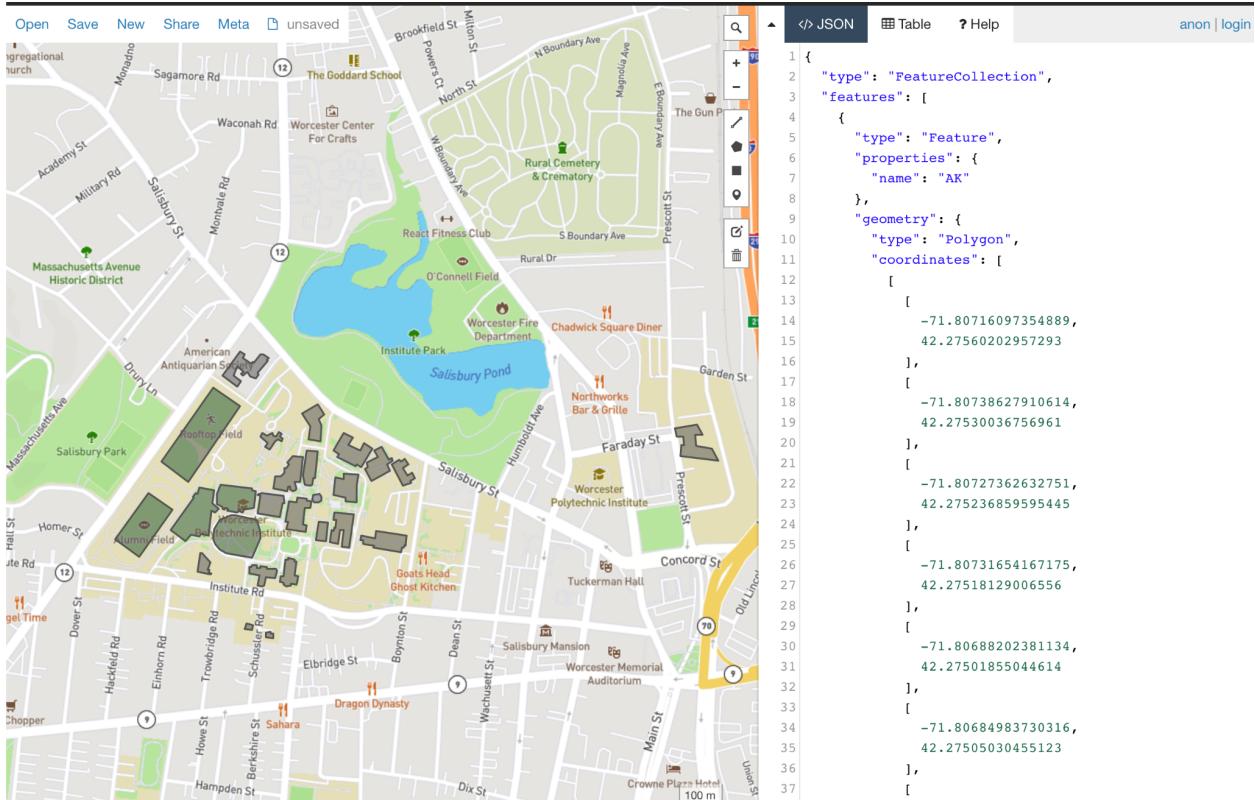
FP Team Programming Meeting #1

[entry by Carley Gilmore, 02.24]

On Thursday, February 24th, the team met to discuss logistics of the interactive calendar and map. A sketch of the user interface is shown on the following page. In the top left, there is a calendar component. The idea is that the user can flip through different dates and get a list of the event happenings on that selected date. The scroll pane in the top right indicates this functionality. Based on this user input, the interactive map of campus will be colored based on the events for the date and hour selected. The map will take up most of the screen and will be able to be scrolled through by the user based on the hour.



Justin shared the 25Live csv data he acquired from Hannah Poirier, the 25Live software administrator with the team. While Amos worked on the calendar, Carley and Justin created a geoJSON file with geojson.io as shown below. The team filtered through the CSV data to find nonacademic events and mapped out the campus buildings accordingly.



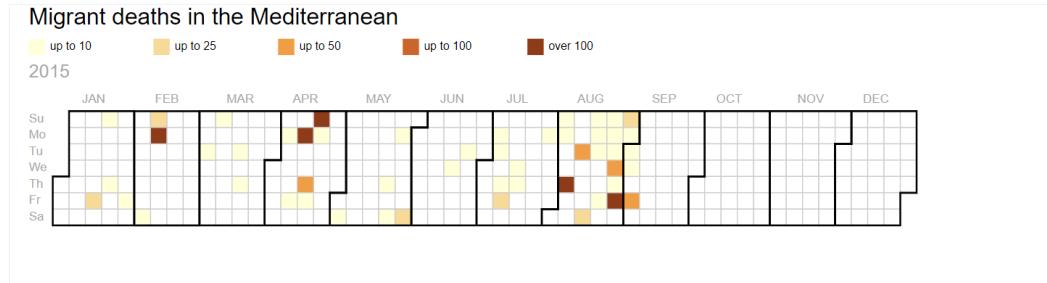
The team planned to meet again to touch base on Saturday, February 26th for another programming session.

[entry by Amos, 02.24]

Our group wanted to make a calendar heatmap, where the different days are color coded depending on the volume of events on that day. For example, if there were many events on March 1st, March 1st would be a darker color than the other days.

I was searching for different calendar inspirations and source code to use for our calendar and I initially found this link:

<https://bl.ocks.org/alansmithy/6fd2625d3ba2b6c9ad48>



But when I tried implementing this visualization calendar on our dataset, it was only able to colorize one data point because only the last data point was being added into the rectangles. I tried to change how the data was being inputted, but once I did that all of the rectangles went away and only the days and months were being displayed. I spent the rest of the meeting attempting to resolve the issue, but no luck was found.

Map Render Update

[entry by Justin Moy, 02.25]

Justin got the map to render properly by rewinding the coordinates using Turf, centering the map and zooming in on WPI. The coordinates needed to be rewound since d3 renders geojson coordinates opposite the current standard.

FP Team Programming Meeting #2

[entry by Carley Gilmore, 02.26]

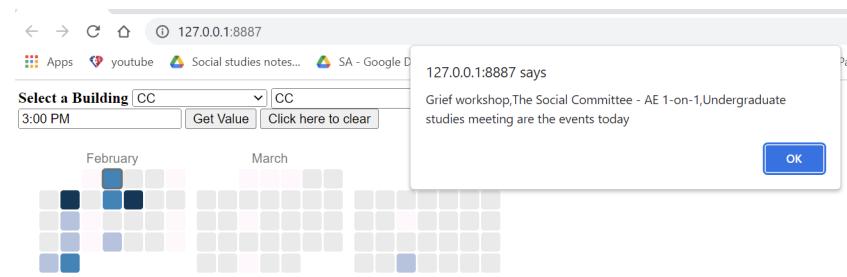
In this meeting, the team met up to discuss progress on the programming of the two separate features of the data visualization.

Justin helped contribute in both the calendar and map sides of the project whenever error handling/input was needed with very helpful input for syncing the project together.

Amos reported that he would be using a d3 calendar chart visualization for project inspiration that would be colored based on the concentration of events on different days in a specified building. The visualization can be found at the following link:

<https://blocks.org/danbjoseph/3f42bb3f0ab6133fc192e878c9030ed>

He was able to get the calendar to appear, and later he added a section for the user to filter the calendar based on building and time as shown below.



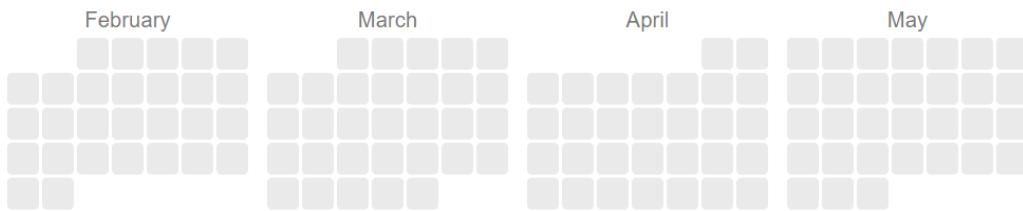
I was able to filter out the map so that the buildings are colored based on a threshold that can be altered based on the number of events in a building on a certain date/time. The screen capture below indicates buildings being colored yellow that have an event count greater than one. Later on, we can update this map so that the buildings are colored differently based on a numerical range of events.



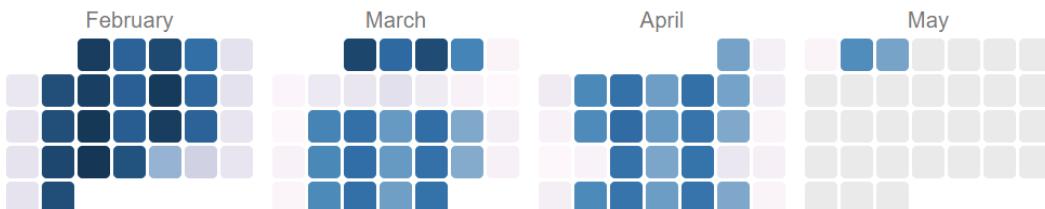
[entry by Amos Roche, 02.26]

After not being able to display our data on the first calendar visualization I found, I was able to find another calendar visualization which Carley linked above in her entry. I tried inputting our

data into the Calendar and all of the days in our dataset were appearing on the calendar, but unfortunately all of the days were the same color as we can see in the visual below.



In the code there was a dictionary called “lookup” which showed the number of events mapped to a date which was the key. But the values of the dictionary were not showing up. I tried changing the format of the dates in the calendar to match our “Day” column but it still wasn’t working. But then I figured out, the dates for each rectangle were masked by the format and it was actually a date object in javascript. Once I set the key to “new Date(d.Day)”, the calendar heatmap was working. This first calendar prototype wasn’t categorized by the building or time as it was just a more general calendar. We can see this first calendar prototype in the image below.



So for example on February 1st, there were 558 events on campus, and these events include staff meetings, sports practices, etc.

After completing this, I made a new column in our dataset called “Location1” using the pandas library in Python. This column was made by splitting the “Location” column before the first space. For example if the location column had “RC POOL 1-9”, “Location1” would be “RC”. This made it simpler to filter the events based on the building and I was able to make two search boxes one for the building type and one for the event start time. The inputs from those search boxes served as the filter for the calendar. The visual with the calendar and the two search boxes can be seen above in Carley’s entry.

Lastly for this meeting, I had to be able to click on a day and it will show all the events depending on the filter for the day. Since the data being inputted into the rectangles(boxes) were dates, I had to make a dictionary where the keys were dates and the values were an array of events for that day. I created a nested for loop to add the values to the dictionary. Initially, I couldn't figure out how to get the text box to appear, so I used the alert function to show all the events on the web browser.

FP Team Programming Meeting #3

[entry by Amos Roche, 02.28]

Initially, to filter the events by building I created a textbox so the user could enter a building. But, to avoid the error of the building being entered incorrectly, I created a dropdown list of all of the buildings and when the user clicks on a building, the calendar shows up for the building and the inputted time.

[entry by Carley Gilmore, 02.28]

On Monday, during class time the team met to combine the calendar and map, separating them into different render script files that are run in the same html file. We also finalized and sent out our survey on Event Literacy to the WPI community. We used the following advertisement:

Hi all!

The following survey is an assessment of WPI student event attendance. The results of this study will be used to communicate the extent to which students attend events and serve as a final supplement in a CS480X Data Visualization Final Project. If you could take a few minutes out of your day to take the survey, it would be greatly appreciated.

Thank you!

The survey was distributed via the WPI subreddit and Discord server as well as other club channels that the team is involved in.

We planned to meet again on Zoom before the submission of our project to finalize our data visualization and create a Zoom video on our final project.

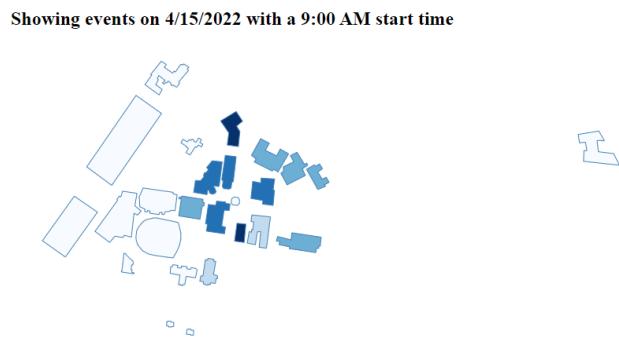
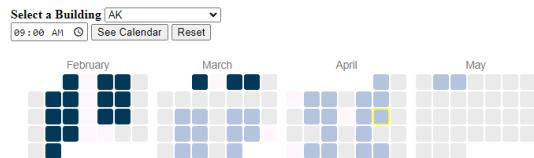
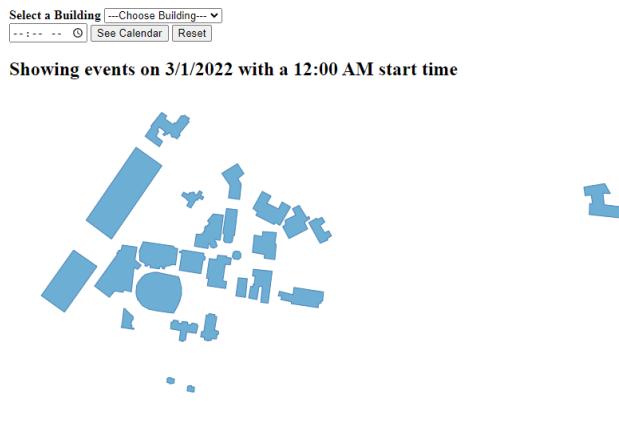
Update on Interactions with Calendar and Map

[entry by Justin Moy, 02.28]

I've completed the following things and pushed them to the git:

- Coloring of buildings now reflects the number of events occurring in them at a given time.
- Time can now be used as an input box instead of a text box
- Reset and see calendar will appropriately update the map
- Clicking on a day on the calendar will appropriately update the map
- By default the map will display events on the current day that start on the next hour
- Added text that shows what day and time the map is displaying

The pictures below show the current state of the visualization before and after a user enters a building and time:



FP Team Programming Meeting #4

[entry by Amos Roche, 03.02]

Our group didn't prefer that when you clicked on a day, the events would show up in a web browser alert box. We then used a d3.select(#event), and used a loop to print out the events line by line for the day.

[entry by Carley Gilmore, 03.02]

We altered the calendar to have outlines around the days that events are occurring on. We made finishing touches to the data visualization, adding an informative text box with a list of the events on the date the user clicks as well as the building location the event is happening in. For events that do not start on the hour, we used a round up function to show the event that is in session during that time.

We took an ample amount of time updating the CSV file again with filtering only social/general educational events. We decided to filter out the following event types:

Unnecessary Event Types

- Athletic External
- Athletic Camp
- Athletic Meeting
- Athletic Practice
- Conference
- Course Section
- Exam
- Express Scheduled Meeting
- K-12 Program
- Maintenance Renovation
- Make-up Class
- Open House
- Photo/Video Shoot
- Reception/Banquet
- Retreat
- Space Hold
- Student- Ceremony
- Student- Conference
- Student- Instructional Assembly
- Student- Photo/Video Shoot
- Student- Project Work (MQP,IQP)
- Student-Retreat
- Study Session/Review (Office Hours)
- Training/Workshops

After these events were updated, we added finishing touches to the interface with an additional description of our project, the need for interactive visualizations for students to be able to see event happenings on campus as expressed in our survey data, and cleaned up the styling a bit.

The description we added to our user interface is as follows:

Title: 25Live Interactive Calendar and Map

Description: Welcome! The data visualization above is based off of 25Live data obtained from the 25Live software administrator on February 24, 2022. The data that we received ranges from February 1st to May 3rd. We have filtered the data to resemble socially/professionally enriching events for students.

How to use the visualization: Select a building and time from the menu below. Note: Please choose events by the whole hour value; i.e: 1:00 PM. A calendar will show up with a variety of colors. The darker blue dates represent days with a high concentration of events in the building at the given time frame. Grey dates represent a lack of events at the specified date/time combination. Lighter blue dates represent minimal events. Days with events in the building during the specified time will be outlined with a blue border. When you hover over a date, the exact date will appear and the number of events happening. When you click on a date, a synopsis of the events will appear underneath the calendar.

Additionally, you can interact with the map below, which highlights all of the buildings based on event concentration at the specified date and time in the calendar. You may also see the calendar change when you click on a different building, and you can look through events in the same means aforementioned. When you hover over each building, you will see the abbreviation that describes the building. The buildings on the map include religious/cultural centers and do not include residential buildings or buildings not listed in the 25LiveData.

Here is a key representing the abbreviations:

AK	Atwater Kent
FL	Fuller Labs
KH	Kaven Hall
SL	Salisbury Labs
WB	Washburn Labs
UH	Unity Hall
SH	Stratton Hall
AH	Alden Hall
RILEY	Riley Commons
FBC	First Baptist Church

WEST	Fountain
HA	Harrington Auditorium
IS	Innovation Studio
RC	Recreation Center
QUAD	Quad
HL	Higgins Labs
CC	Campus Center
OH	Olin Hall
GH	Gordon Hall
HH	Higgins House
MORGAN	The Wedge in Morgan Hall
CRC	Collegiate Religious Center
AF	Alumni Field
GP	Gateway Park
RT	Rooftop Field
OASIS	OASIS Cultural Center

We also reviewed the survey that we had distributed on Event Literacy for communicating the need for our visualization and offering recommendations for 25Live.

Lastly, we recorded our video on Zoom walking through our visualization and discussing how we created it and its intended use.

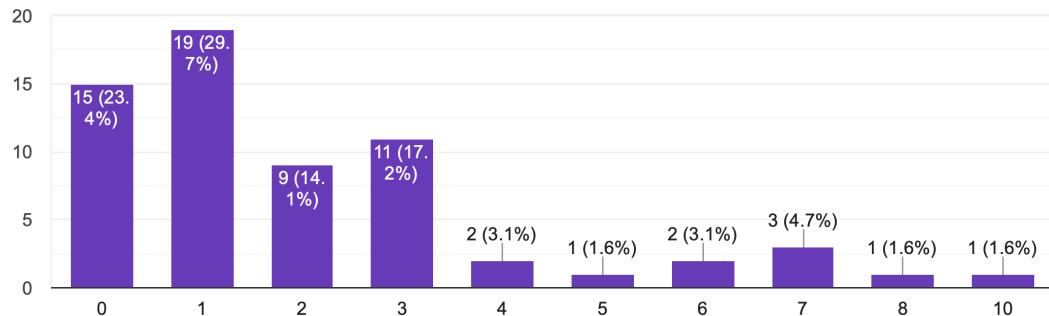
Event Literacy Survey Results

[entry by Carley Gilmore, 03.02]

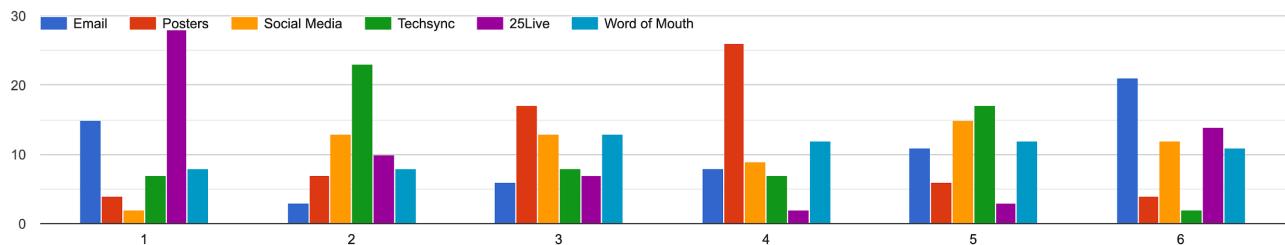
64 people responded to our Event Literacy Survey. Charts that summarize the quantitative results are shown below:

How many events (GBMs, workshops etc) on average do you attend per week?

64 responses

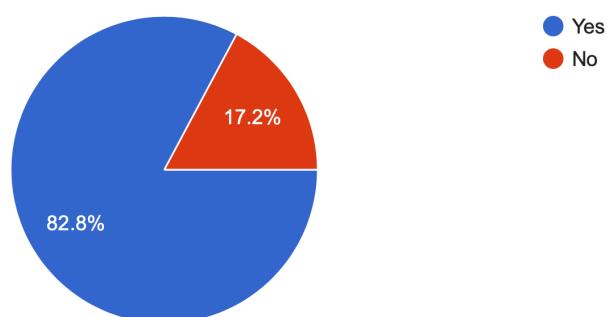


Rank how effective you consider each of the following methods of learning about events. 1 worst 6 best



Do you want to attend more events on campus?

64 responses



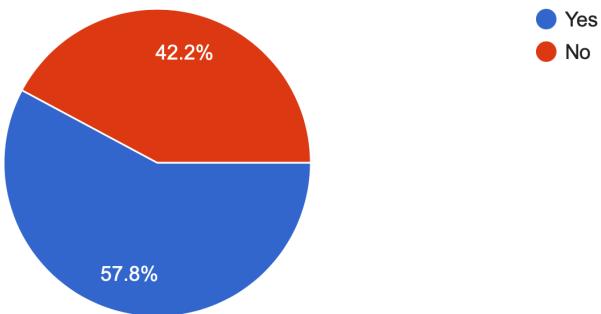
What is the primary reason you do not go to more events?

53 responses



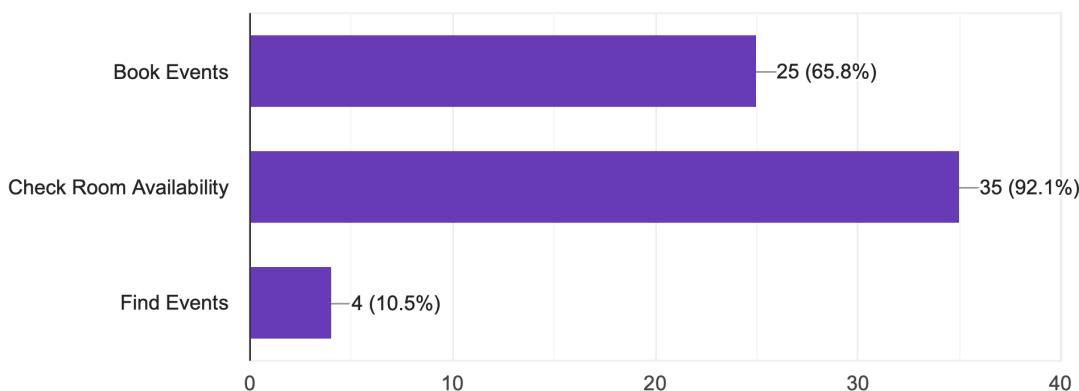
Have you used 25Live?

64 responses



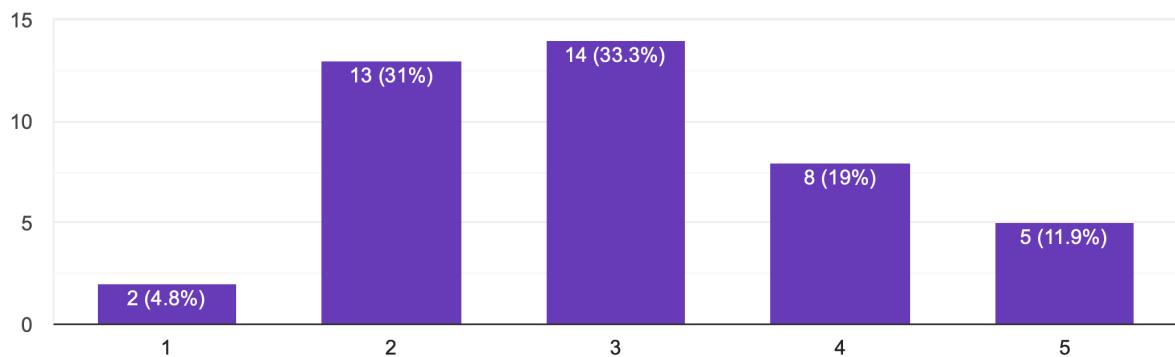
What have you used 25Live to do?

38 responses



How easy to use is 25Live

42 responses



(1 represents Impossible, 5 represents Easy)

Evaluation

[entry by Amos, 03.02.22]

With our general calendar which shows the number of events on each day for all of the days, we learned that there are many events occurring on campus even if they aren't open to all events. For example in the first two days of February, there were 1000 events on campus. I think we were able to answer our questions thoroughly, because we were wondering which buildings on campus have more events during different times of days, and our visualization shows exactly that. We are also able to see which days have more events than others which is important, because students can look at days with more events and their availability.

I think for the amount of time we had, we were able to make a comprehensive and interactive visualization that will allow students to have an easier time finding events on campus. But I think our application can be further improved with implementing email/text notifications. For example, if someone was interested in more cultural events, they can get email/text notifications once those events are getting closer to the date of the event.

Link to Site and Video

Link to Site: <https://users.wpi.edu/~jmmoy/BCB4002/final/>

Link to Video: https://www.youtube.com/watch?v=9ITw_u35Otc