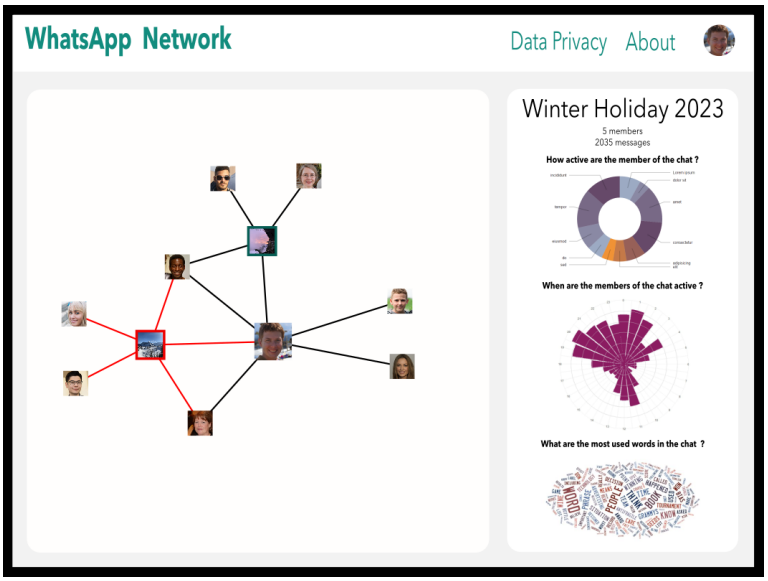
What'sViz

The goal of What'sViz is to give any WhatsApp user a comprehensive overview of its network of contacts. Through this reader-driven visualisations, the user will be able to interact with the tools to explore his relation landscape.

Website sketch:

This sketch illustrates a simplified version of our visualisations. (With far less contacts than an average user is expected to have, this simplification has been made for easier construction of the sketches.) The red node and edges in the graph highlight the contact / group that the user has selected (by clicking on it) for more in depth exploration in the right side panel.
All images of person were taken from:
https://thispersondoesnotexist.xyz/



Visualisations

In this section we will break down the above sketch in sub parts, describe their purpose and list the tools and lectures we rely on to build them. The website is implemented with React and D3.js, thus we will be directly relying on lectures on Javascript and D3.js. Based on the storytelling lecture we have chosen a reader-driven approach. The user will be able to freely explore and navigate the graph according to his curiosity.

1. Network Graph

The network graph is the main visualisation of the website, it first gives a general overview of your network of contacts and its groups/clusters. Each node represents a contact (equivalent to a one-to-one chat) or a group chat. Each edge represents a connection between a contact and a chat (membership) or a contact to contact relation (exchange of messages equivalent to a membership to the one-to-one chat).
The graph will also be the main interactive feature of the visualisation, selecting a node will define the content of the side panel. By clicking on a contact/chat the user will be able to transit from network-wide to contact/chat-wide focus.
We plan to use D3 force simulation for the graph; this will let us define repulsing forces between nodes and attracting forces along the edges, hopefully leading to a meaningful clustering of the contacts. To design this visualisation we will rely on the graph lectures but also indirectly on the Color perception and Marks channels lectures.

The core visualisation is a graph with clusters of contacts, nodes should be clickable to be explored more in depth in the side panel. Extra ideas are to display profile pictures of the contact/chat as the nodes, display some basic contact/chat info on hovering, let users drag nodes for a better "interactivity feeling", and some contact filtering function.

2. Side Panel

2.1. Chat members activity

To understand the group dynamics, one of the key indicators is the participation of its members. Therefore, we built a panel representing a pie chart with the percentage of each user's messages in the chat. For instance in groups related to a trip, if someone has very little messages, we might want to ask the person more details about their opinion. Likewise to the network graph, we need the basic lectures for Javascript and D3.

2.2. Chat members time of the day

Another take on these dynamics is at what time of the day the group is active, giving insights into when the group/contact is the most reactive (thus susceptible to answer), as well as monitor its activity (working hours for work related chats etc). The most intuitive design is a 24h clock-like histogram plotting the proportion of messages sent by hour. The base plot should show the user activity hour vs the rest of the group/other contact. Additional functionality could include contact selection in the group to display his specific stats. Here we also need the lectures on Javascript and D3.

2.3. Chat most used words

Because our goal is to give more insight into the social network per person of WhatsApp, showing statistics of a specific chat (i.e. PM with another user or group) in the form of the most frequently used words in the conversation is helpful (and interesting to see how it changes from chat to chat). This feature can be particularly useful for individuals or groups who want to gain a quick understanding of the topics and trends discussed in any chat. By using a word cloud, the most common words are displayed in a visually appealing and easily digestible format, although to show the statistics precisely we know it is not the greatest visualisation. Still, users can quickly identify the most frequently mentioned words and gain insights into the main themes and sentiments of the chat, hence the word cloud in the side panel is an intuitive and effective visualisation to quickly and easily make sense of large amounts of text data (on the order of thousands of messages in big chats).

Similarly to the network graph, we need the basic lectures for Javascript and D3, as the word cloud is done using D3.js. We did not completely implement this word cloud ourselves, but we are reusing an existing implementation called d3-cloud. Extra ideas specifically for the word cloud are the following: on click of the word cloud open it in a bigger form (allowing even more words onto the screen to convey more information), colouring the text in the colour of the language they are in (giving also at quick glance the distribution of language used per chat), using different tokenizers and giving the user the ability to choose which one to use (stemmer, normal tokenizer, or our custom stop word filter).

Our prototype can be found on the github.io page of our project:
https://com-480-data-visualization.github.io/project-2023-what-s-viz/