

Computer Networks

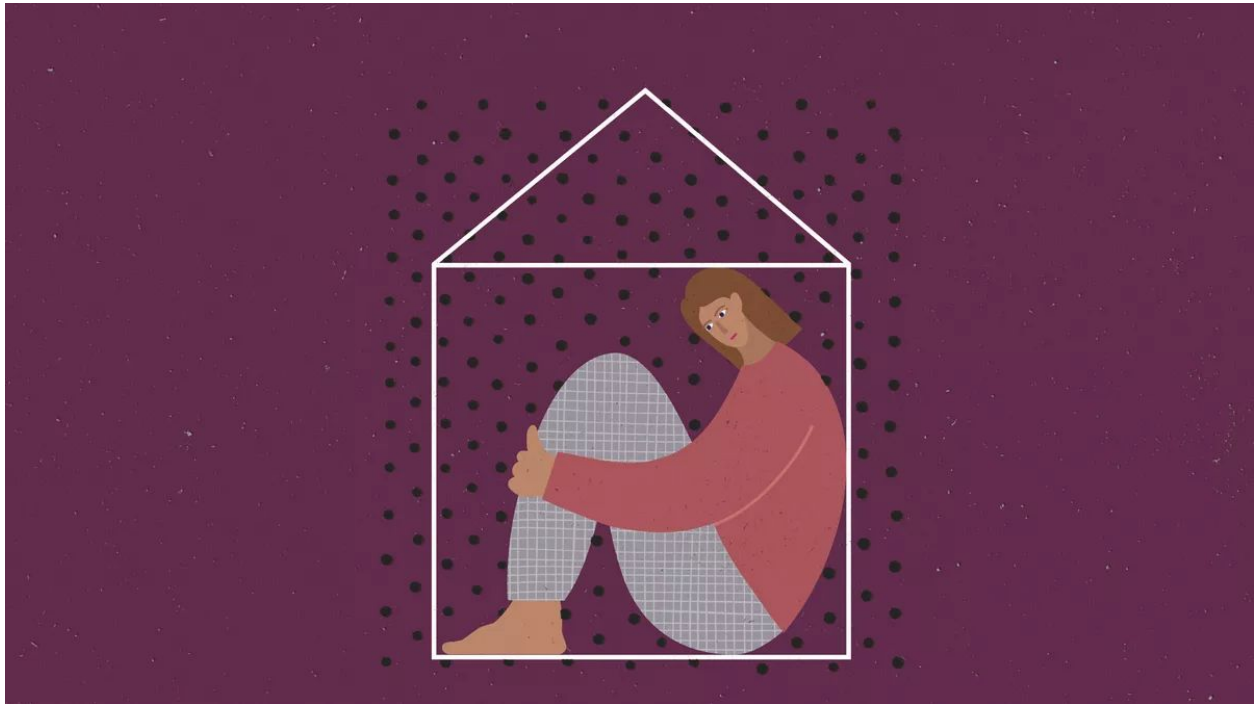
Project Report



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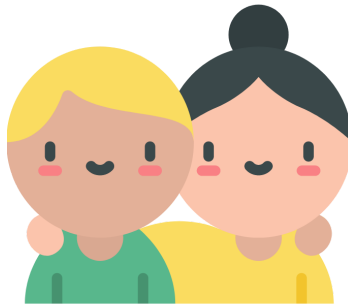
Introduction



'The only constant is change'. These few words feel more suitable than any other combination, especially based on the circumstances we are stuck presently in. For the last 8 months or so now, we have been 'quarantined' irrespective of our social status, mental or physical health, etc. For the first few weeks it seemed a nice change, but gradually we all felt trapped. Not being able to physically interact with our peer groups and friends for this long a time period has somewhat left us feeling forlorn. In this desolate time, we try to improve this 'friendless' situation by providing a platform for interaction.

With this project we aim to implement a social platform named "Friend Me" where using the user details we would cluster the users into groups using machine learning. Persons in the same group would be having similar interests i.e. would have high probability to be friends with each other. We also intend that the persons in a room have a standard conversation that allows them to connect with each other. To do this, each user would be using our user interface (currently web based) to communicate with our server using HTTP requests and Socket based communication.

Idea

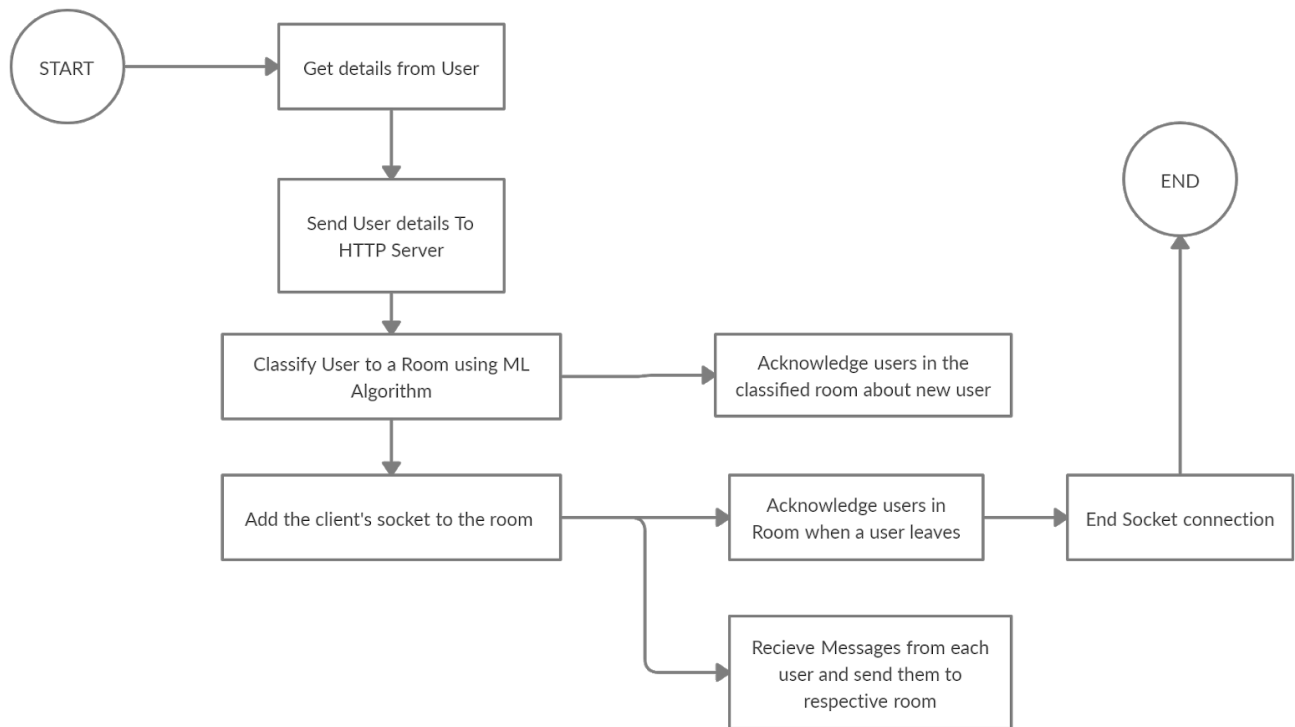


The idea behind this project was to group persons with similar interests into one category and help them connect with each other through a remote socket connection. In times like these we often hear about people needing mental support but it is only so rarely that someone actually makes an effort to do something about it. This concept is solely based on the idea that people with similar interests and have gone through the same experiences find it easy to share things with each other and talk about what they have in mind.

Our aim is not to create a mental health support group or a dating website of some kind, we simply strive to create a platform where two persons keen about akin things can discuss it with each other. A real life case could be two individuals who are passionate about football find each other to converse about this world and for at least those moments try and forget all about their hardships. It is our shared belief that ‘sometimes all a person needs is a good friend to get through’ after all ‘a friend in need is a friend indeed’. Finding the ‘need’ does not seem to be an issue right now, so we shall provide the ‘friend indeed’!

Approach & Algorithm

One of the key things to note is that the peer group formed always has something or the other in common, the essential point being it is not random. *The existing platforms provide these services on a random basis, so the two users may have nothing in common but they are aggregated together.*



Hence, to overcome this barrier, we have taken some basic features or personality traits which every person possesses and differs for everyone. Based on this idea we have created rooms that have these inherent properties and anyone assigned to a room possesses similar interests as the other persons in the room. This inturn will help evoke the common ground which is necessary for a quality conversation. The ease of striking up a conversation on this platform is also remarkable since there is already a common ground present.

This platform can be easily configured using the concept of Sockets and socket programming and used Socket.IO[1][2] framework to implement it.. A socket is one endpoint of a two-way communication link between two programs running on the network. A socket is bound to a port number so that the TCP layer can identify the application that data is destined to be sent to. An endpoint is a combination of an IP address and a port number. Every TCP connection can be uniquely identified by its two endpoints. This way we can have multiple connections between our clients and the server, which is the basic requirement of our project. Socket programming is a way of connecting two nodes on a network

to communicate with each other. One socket(node) listens on a particular port at an IP, while another socket reaches out to the other to form a connection. Server forms the listener socket while the client reaches out to the server.

Observation & Results

The figure displays three screenshots of a web application titled "FRIEND ME". Each screenshot shows a user profile form with the following fields:

- Name:** Rishabh Chawla, Rishabh Sinha, and Raju.
- Age:** 21, 21, and 32.
- Movie:** action and adventure, comedy and drama, and mystery and thriller.
- Interests:** Sports (checked) and Travel (checked for the first two users, unchecked for Raju).
- Submit Button:** A green button labeled "SUBMIT".

The background of the application is dark with a pattern of colorful cartoon avatars and icons.

Fig 1: Three users joined simultaneously

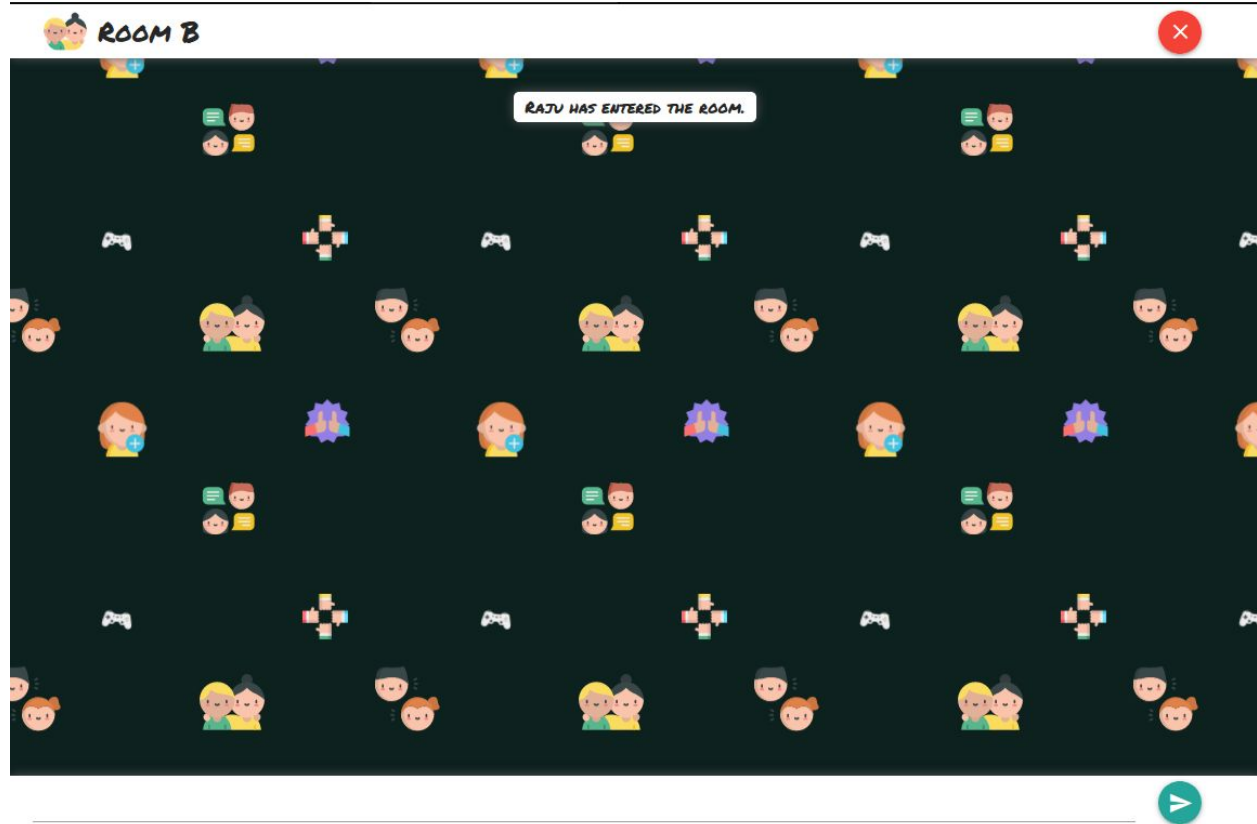
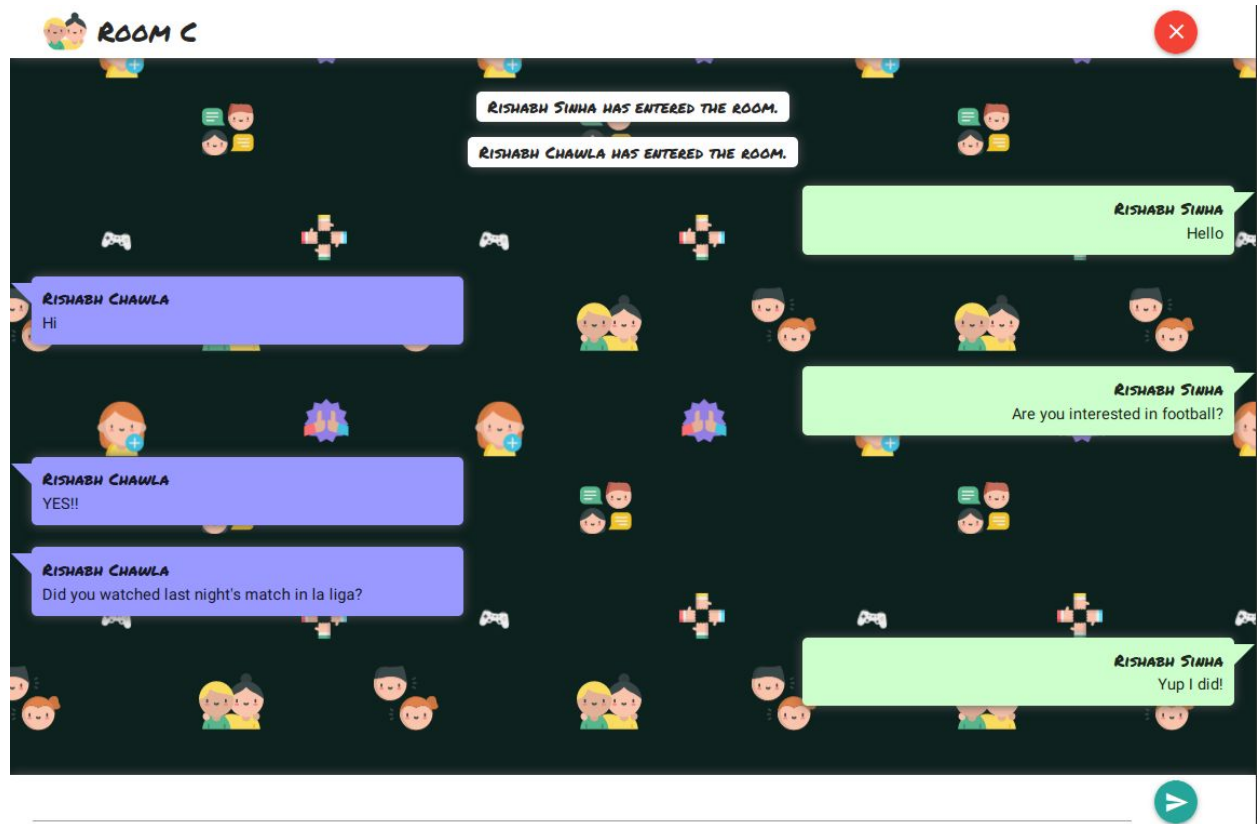


Fig 2: Based on similarity, users joined rooms assigned by the algorithm

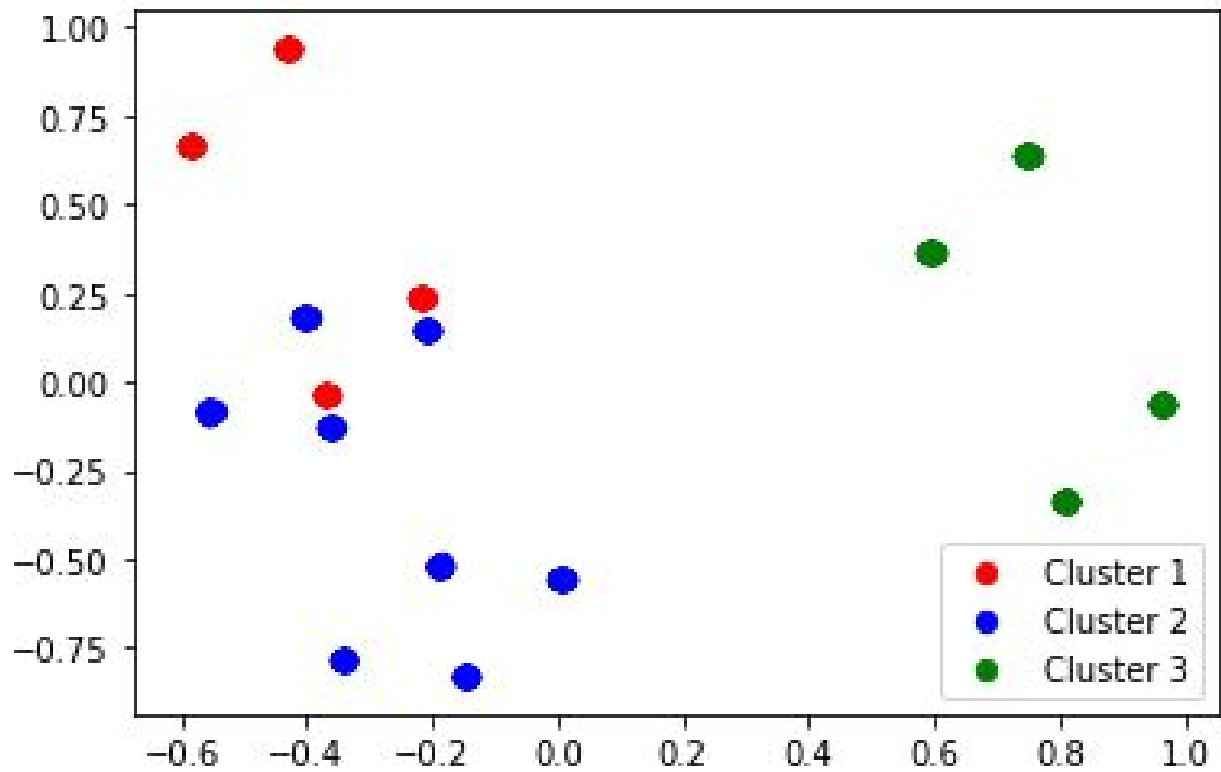


Fig 3: Scatter plot for clusters formed between two components after PCA
Variance explained by 1st component = 21.54%
Variance explained by 2nd component = 20.71%

	precision	recall	f1-score	support
0	1.00	0.94	0.97	16
1	1.00	1.00	1.00	22
2	0.92	1.00	0.96	12
accuracy			0.98	50
macro avg	0.97	0.98	0.98	50
weighted avg	0.98	0.98	0.98	50

Fig 4. Classification report for room classifier

Conclusion

We successfully completed the project and reached all primary goals as decided.

As for future scope we can:

- Add support for chat filtering for abusive languages
- Add features like liking the comment, emojis, gifs, etc.
- Show the “Room specific” widgets to the user, like showing live scores in a room with sports in common.

References

- [1] socket.io documentation - <https://socket.io/docs/v3>
- [2] flask socket.io documentation - <https://flask-socketio.readthedocs.io/en/latest/>
- [3] Xue, M., & Zhu, C. (2009). *The Socket Programming and Software Design for Communication Based on Client/Server*. 2009 Pacific-Asia Conference on Circuits, Communications and Systems. doi:10.1109/paccs.2009.89
- [4] Cai, M. (2012). *The Design Method of Network Chat System Based on Socket and Cloud Computing*. 2012 International Conference on Computer Science and Service System. doi:10.1109/csss.2012.157