NETS2120 Pets.com Project Report

Overview

Pennstagram is a social media app with the ability to sign up/ log in, set/change your profile, link with your actor-look alike, add/remove friends, receive a custom feed with smartSearch capabilities, and chat live with others & your AI assistant!

Technical Description

Pennstagram is built on node.js and React with external endpoints to:

- AWS RDS Database for persistent data
- AWS S3 for images and other large files
- Livy & Spark for cloud & distributed computing of algorithms (Social Rank & Post adsorption)
- Kafka for connections to other social media apps & Twitter Feed
- ChromaDB for actor-image linking, natural language search & AI chatbot.

Frontend-Backend are connected by REST API, as well as Websockets for the Chats page.

Design Decisions

BACKEND

REST routes

- Includes routes to all external endpoints (RDS, S3, Livy, Kafka, Websockets, ChromaDB)
- Tracking who is online uses a middleware function that runs before user calls to the REST API.

Websockets

- Holds sockets of active users & associated chat rooms in a Map
- Fires on events from users like sendMessage, receiving invite, accepting invite, rejecting invite, leaving chat
- Polls for socket status for inactivity (? maybe)

RDS Database

- Key'd on id where possible (user_id, chat_id, post_id) that are primary keys, not null, and auto-incrementing for consistency

S3

- Users can create posts with optional captions and images. If image is uploaded, we create a unique 32 byte image id which we save in the RDS database and use as a key to upload to the photo's S3 bucket.

Spark

- Distributed Computing for PostRank

Kafka

- Have a consumer that subscribes to FederatedPosts and Twitter-Kafka topics. Each time a post is received and Kafka is turned on, we insert the post into our local RDS database under the Federated Posts and Twitter Kafka users respectively

- We also have a producer that sends a message to the FederatedPosts topic each time a user posts.

ChromaDB

- Have created a posts-2 database that stores post and user data. We have done this by turning some elements of the mysql databases users and posts into a Chroma db embedding. It uses vector similarity to compare query, and return the most similar embedding. The database is scalable because it embeds a post when it is created, never in bulk.
- Have created the face-api-database that uses k-similarity to return 5 most similar actors.

FRONTEND

Signup/Login

Profile

Friends

- Unset online times default to Jan 1st 2024
- Online times of recommendations also show up

Home (Feed)

- Create Post:
  - Ability to create posts with optional captions and images
- Likes, comments:
  - Each post has the ability for users to like and comment and displays like counters and previous comments from other users. Each time a user likes or dislikes a post, we send a post request to add (or remove) the like from the likes database (similarly with adding comments).
  - Used to get likes and comments by sending a get request for each individual post. However after Twitter-Kafka populated the feed with 1000+ posts, we redid the feed query to join likes, comments, and post content together into just 1 query.
- Hashtags:
  - Users are able to pick hashtags they want to subscribe to at the beginning when they register for an account– which is inserted into the database. Each post posted (or received by Kafka) and comment is parsed for hashtags and each match is added to the hashtag table.

Chats

- Invites persist in RDS database (they are cleared when handled (accept/reject))

Changes & Lessons

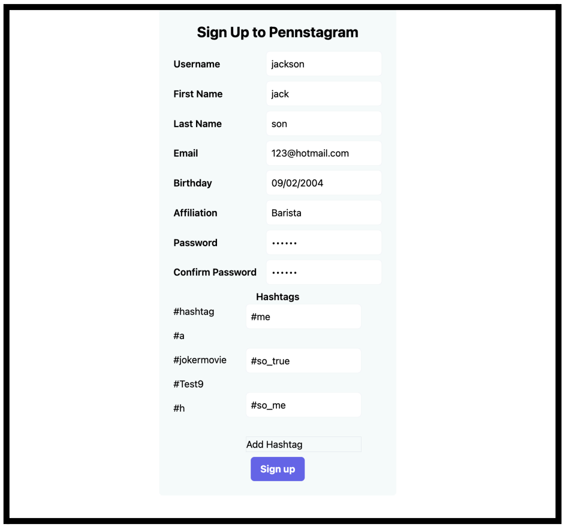
We learnt a lot about teamwork & software development in the team. It was cool that everyone was able to learn and get really good at a particular microservice framework. A challenge was thinking about implementation strategies and designs ahead of time, because one way can be a headache and another can be a huge headache to change later.

Extra Credit Features

- Websocket for chats
- Light/Dark Mode
- Infinite Scroll
- User search with AI chat

Screenshots

Signup



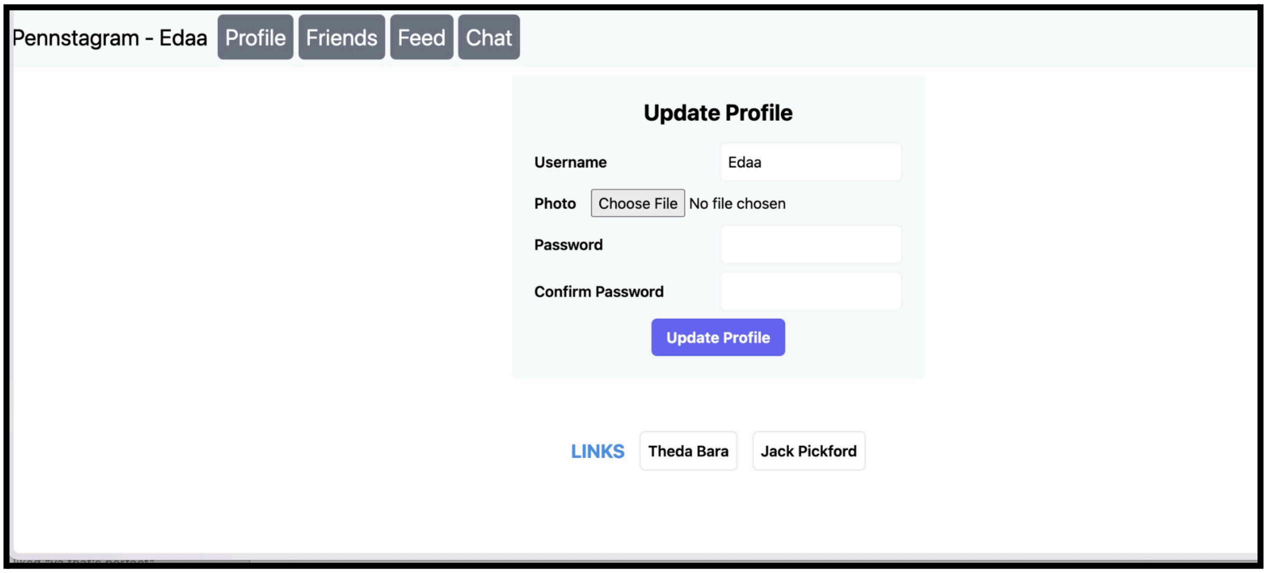
Sign Up to Pennstagram

Username	jackson
First Name	jack
Last Name	son
Email	123@hotmail.com
Birthday	09/02/2004
Affiliation	Barista
Password	••••••
Confirm Password	••••••

Hashtags

#hashtag	#me
#a	
#jokermovie	#so_true
#Test9	
#h	#so_me

Profile



Update Profile

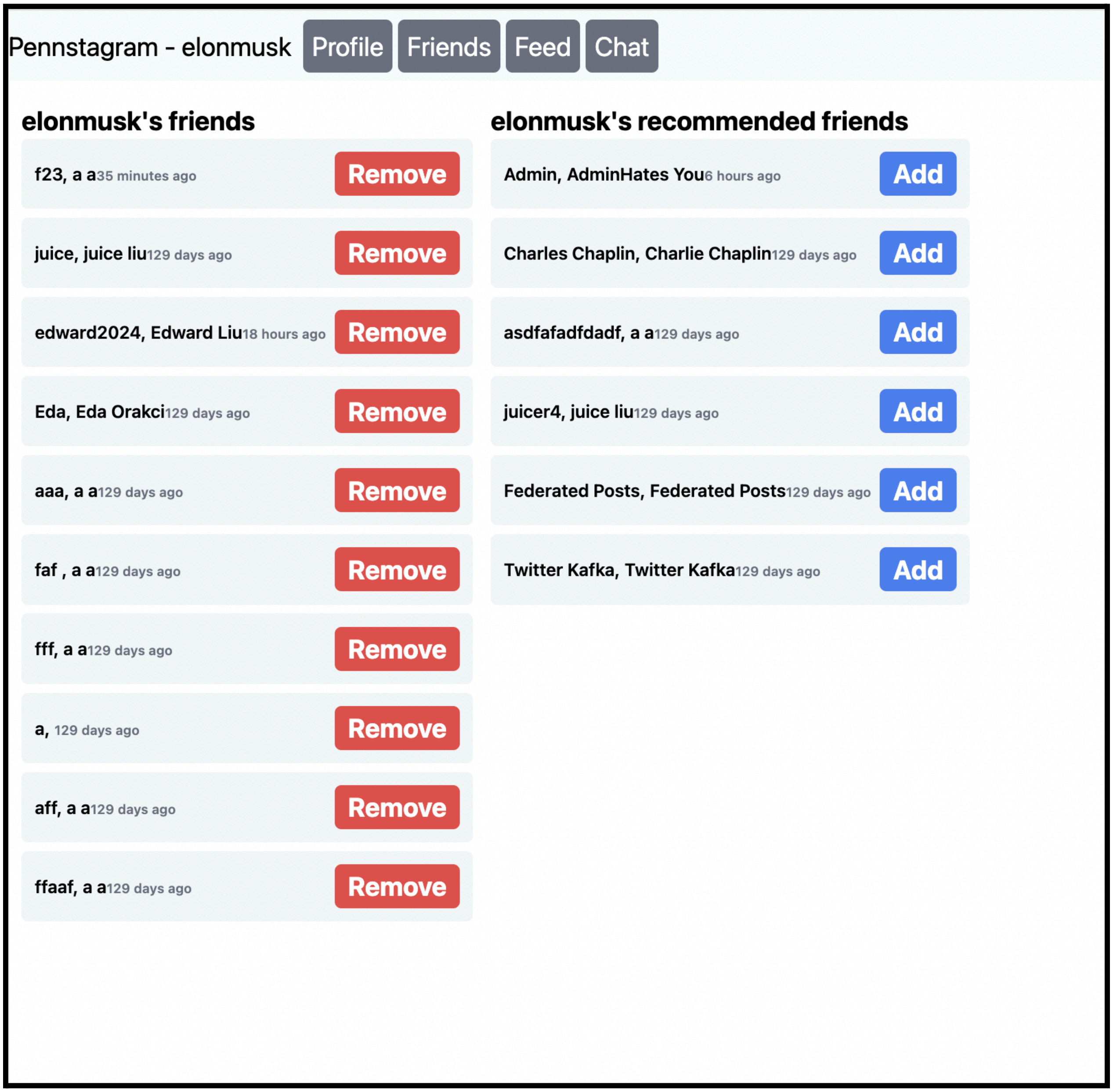
Username: Edaa

Photo: Choose File No file chosen

Password:

Confirm Password:

Friends



Pennstagram - elonmusk

elonmusk's friends

f23, a a35 minutes ago

juice, juice liu129 days ago

edward2024, Edward Liu18 hours ago

Eda, Eda Orakci129 days ago

aaa, a a129 days ago

faf , a a129 days ago

fff, a a129 days ago

a, 129 days ago

aff, a a129 days ago

ffaaf, a a129 days ago

elonmusk's recommended friends

Admin, AdminHates You6 hours ago

Charles Chaplin, Charlie Chaplin129 days ago

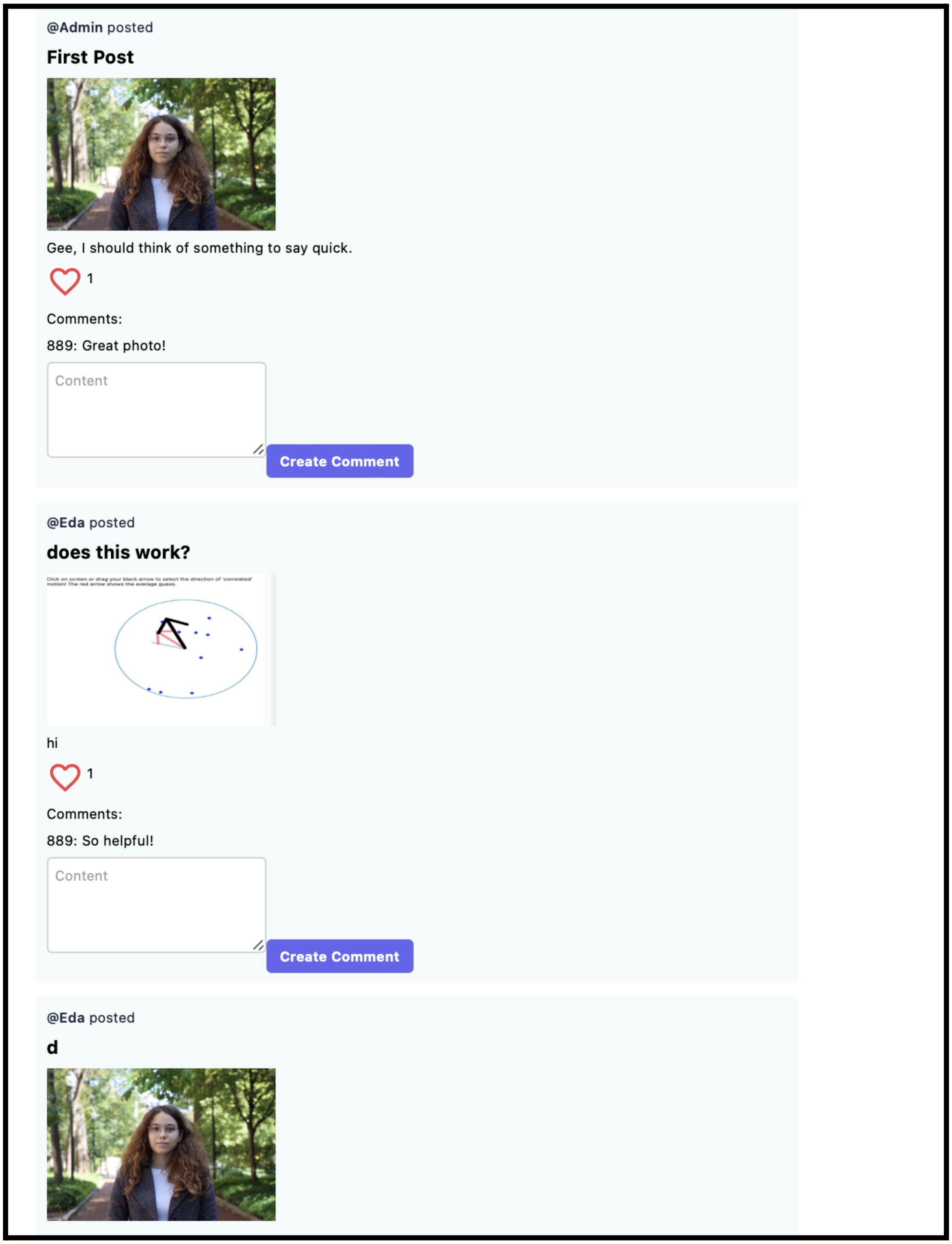
asdfafadfdadf, a a129 days ago

juicer4, juice liu129 days ago

Federated Posts, Federated Posts129 days ago

Twitter Kafka, Twitter Kafka129 days ago

Home (Feed)



@Admin posted

First Post

Gee, I should think of something to say quick.

♡ 1

Comments:

889: Great photo!

@Eda posted

does this work?

Click on screen or drag your black arrow to select the direction of 'correlated' motion! The red arrow shows the average guess.

hi

♡ 1

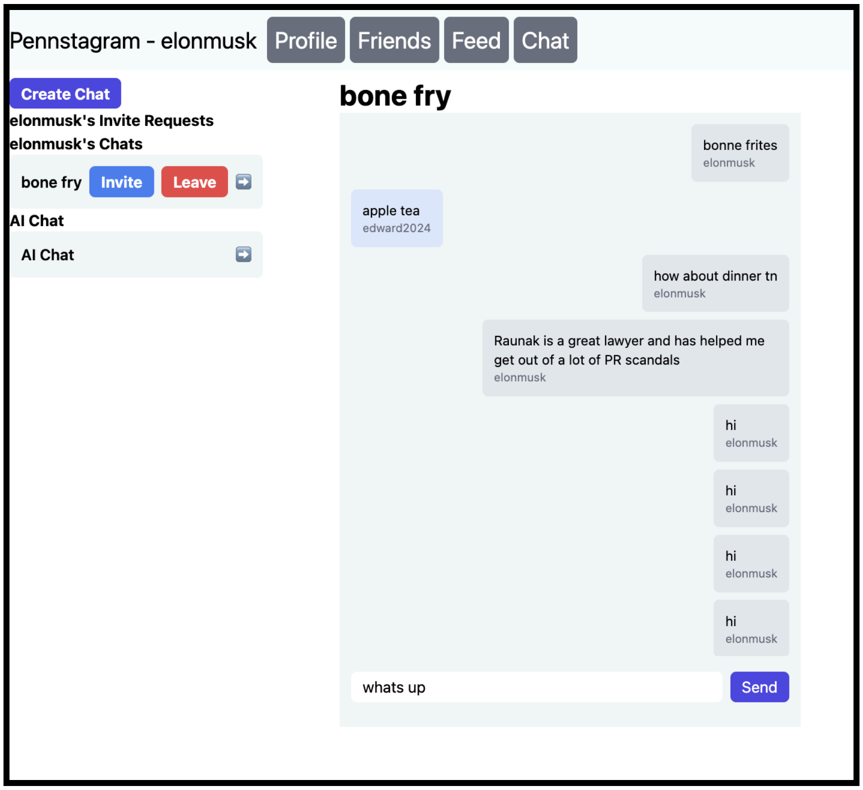
Comments:

889: So helpful!

@Eda posted

d

Chats



elonmusk's Invite Requests

elonmusk's Chats

bone fry

bonne frites
elonmusk

apple tea
edward2024

how about dinner tn
elonmusk

Raunak is a great lawyer and has helped me get out of a lot of PR scandals
elonmusk

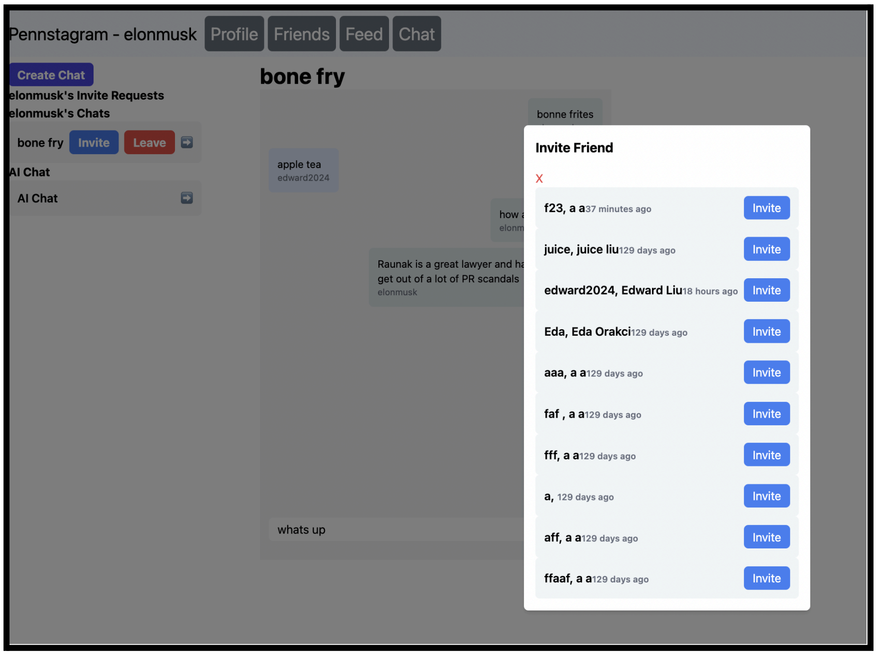
hi
elonmusk

hi
elonmusk

hi
elonmusk

hi
elonmusk

whats up



elonmusk's Invite Requests

elonmusk's Chats

bone fry

bonne frites

apple tea
edward2024

how a
elonm

Raunak is a great lawyer and ha
get out of a lot of PR scandals
elonmusk

whats up

Invite Friend

f23, a a37 minutes ago

juice, juice liu129 days ago

edward2024, Edward Liu18 hours ago

Eda, Eda Orakci129 days ago

aaa, a a129 days ago

faf , a a129 days ago

fff, a a129 days ago

a, 129 days ago

aff, a a129 days ago

ffaaf, a a129 days ago