

# A Reinforcement-based QA Recommender System for Responding to Community-based Suggestions using Enhanced Contextualization

**CMPE 295B - PROJECT ELEVATOR PITCH**

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# PROJECT DESCRIPTION

- **COMMUNITY-BASED QUESTION-ANSWERING (CBQA)** PLATFORMS PROVIDE REGISTERED USERS ACCESS TO A HUGE KNOWLEDGE DATABASE OF QUESTIONS AND ANSWERS ACCUMULATED OVER TIME
  - EXAMPLES: QUORA, REDDIT, STACKOVERFLOW, STACKEXCHANGE
- **USERS CAN FIND** AN ONLINE COMMUNITY TO ASK, ANSWER, AND DISCUSS TOPICS OF INTEREST
- HOWEVER, AS THESE PLATFORMS SCALE TO MORE USERS, **DISCOVERING THE RIGHT COMMUNITY IS INCREASINGLY BECOMING CHALLENGING**
- FOR EXAMPLE, THE REDDIT PLATFORM HAS 430M MONTHLY ACTIVE USERS, 2.6M+ SUBREDDITS AND OVER 138,000 ACTIVE COMMUNITIES[1].

Reddit



[1] B. Molina, Reddit is extremely popular. Here's how to watch what your kids are doing, USA Today, July 26, 2018. Accessed on Nov 27, 2021 [Online]. Available: <https://www.usatoday.com/story/tech/talkingtech/2017/08/31/reddit-extremely-popular-heres-how-watch-what-your-kids-doing/607996001>.





# PROPOSED SOLUTION

- **WE PROPOSE** A REINFORCEMENT-BASED QUESTION-ANSWERING RECOMMENDER SYSTEM THAT:
  - **PROVIDES** COMMUNITY ANSWERS TO USER QUESTIONS
  - **RANKS AND RECOMMENDS** COMMUNITY ANSWERS IN ORDER OF RELEVANCE
  - **SUGGESTS** USERS WITH REFINED QUESTIONS FOR BETTER RECOMMENDATIONS
  - **PROVIDES** A KNOWLEDGE GRAPH OF RELATED COMMUNITIES TO BROWSE
- **WE TAILOR** OUR RECOMMENDER SYSTEM FOR THE REDDIT PLATFORM
  - **ADDRESSES** THE IMMEDIATE NEED OF 430M MONTHLY REDDIT USERS
- **WE ENSURE** OUR SYSTEM IS SCALABLE, EXTENDABLE AND ACCURATE
  - **USES** CLOUD SERVICES FOR SCALABILITY
  - **USES** BOTTOM-UP, AGILE DEVELOPMENT FOR EXTENDIBILITY AND DURABILITY
  - **USES** DATA AND METRIC DRIVEN MACHINE LEARNING APPROACH FOR ACCURACY

Reddit





# FOR QUESTION REFINEMENT

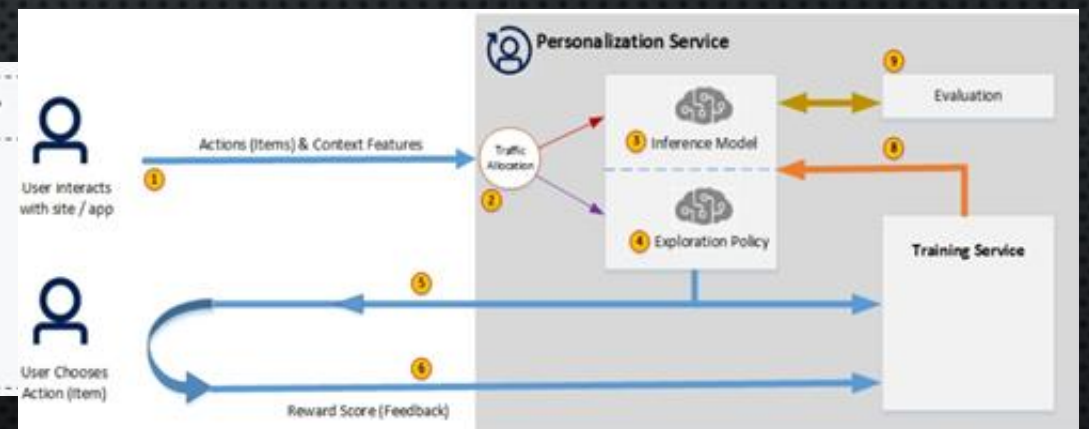
- **PURPOSE:** REFINE THE USER'S QUESTION INPUT TO THE QA SYSTEM
- **USER** POSTS A QUESTION
- **SYSTEM** LEVERAGES A NLP PARROT PARAPHRASER BUILT ON T5 LANGUAGE MODEL TO RETURN REFINED QUESTIONS AS SUGGESTIONS
- **USER** ACCEPTS OR REJECTS REFINED QUESTIONS
- **SYSTEM** LEVERAGES AZURE PERSONALIZER REINFORCEMENT LEARNING SERVICE TO LEARN RESPONSE FOR FUTURE INTERACTIONS

Reddit



Input\_phrase: Can you recommed some upscale restaurants in Newyork?

list some excellent restaurants to visit in new york city?  
what upscale restaurants do you recommend in new york?  
i want to try some upscale restaurants in new york?  
recommend some upscale restaurants in newyork?  
can you recommend some high end restaurants in newyork?  
can you recommend some upscale restaurants in new york?  
can you recommend some upscale restaurants in newyork?

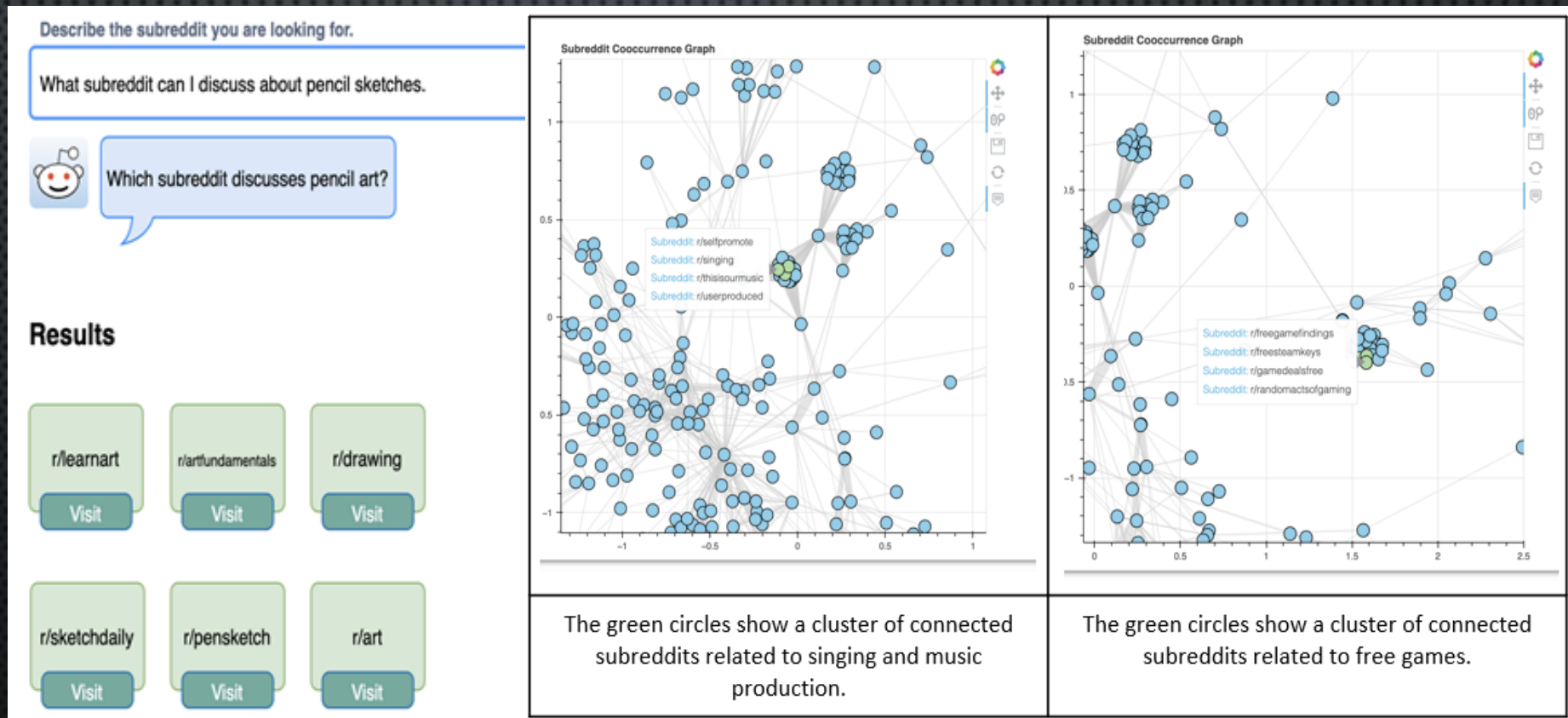




# FOR QUESTION ANSWERING

- **FOR THE USER ACCEPTED** REFINED QUESTION, SYSTEM **RESPONDS WITH RANKED SUBREDDITS** AND A **KNOWLEDGE GRAPH** OF RELATED SUBREDDIT COMMUNITIES

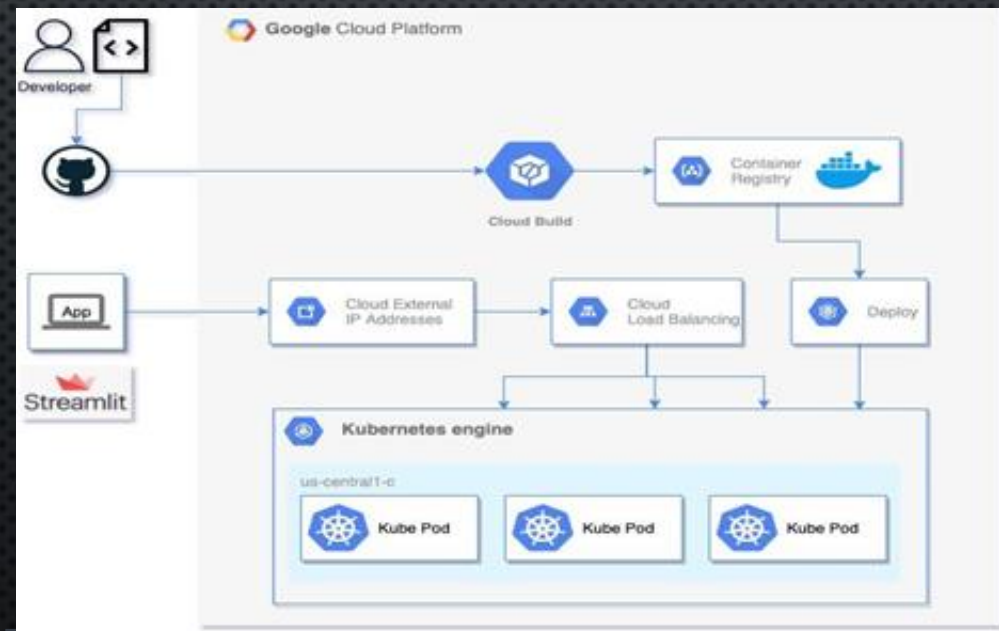
Reddit



# IN SUMMARY

- **WE DELIVER A DATA AND METRIC DRIVEN SYSTEM** WITH MACHINE LEARNING LEVEL OP2 INTEGRATION VIA CI/CD, MODEL MONITORING, PIPELINED DEVELOPMENT, PIPELINE TRACKING, AND LOGGING, **DEPLOYED ON GOOGLE CLOUD** FOR SCALABILITY, EXTENDIBILITY, DURABILITY AND ACCURACY
- **AN ONLINE WEB APPLICATION** WITH ADAPTIVE LEARNING AND REAL-TIME SERVING

Reddit



The screenshot shows the 'Find A Reddit' web application interface. It features the Reddit logo at the top. Below the title, there is a subtitle: 'A Reinforcement-based QA Recommender System for Responding to Community-based Suggestions using Enhanced Contextualization'. A text input field labeled 'Help text' is present. The main section is titled 'Tell us what subreddit you're looking for.' and includes a text area for 'Provide your description'. Below this, there is a text input field for 'Set advanced environment options'. A section titled 'What type of question improvement would you prefer?' contains four radio buttons: 'Adequacy' (selected), 'Fluency', 'Diversity', and 'Best'. A 'Find subreddit' button is located below the radio buttons. At the bottom, a feedback section asks 'Did you mean: "a reddit page to ask police officers a question about procedures"?' with 'Yes' and 'No' buttons.

