

# AL CASE STUDIES

## CHAIBOTS

"computer programs designed to simulate human conversation through text on vaice."

#### use cases a someoned arranged that when it

- 1. customer senvices 2. lead generations 3. PA 4. tuben experience 5. refficiency
- Core Componento
- 17 upon input: text Ispeed by upon
- 2> natural language processing (NLP): gives computer ability to understand, translate, generate human language
- 3> natural language understanding (NIV)
  - · Intent Recognition: pro of figuring west what (treat chem down four name of
  - · Portity Portraction: pac of extracting specific pieres of estitus balles, tratai that the entities
- ur Dialouge management
  - · State tracking: Keeps track of comus history & context.
- \$7 Response Selection / Action Determination based on intent, entity and dialogue state, this

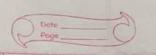
Data\_\_\_\_\_

module decides what the chattoot whould do next - aak a follow-up question, cretrieve in to

- (external data about were and other things)
  chatbot extracts there through API calls.
- Trepposable for matting the actual response in natural-sounding languages. (human like)

### Types of Chatbab

- 1. Rule-Based thank broken
  - follow profileined (IF con THEN action corespondes)
  - working: bot matches cheywoods as pattern from user input to database
  - eg fræ bot, if werritypen skripping Creat, bæd might have mule that viecognize skripping & count and vieppands with Standard Shipping Count 35
- 2. AI powered (ML (DL)
  - They use me to dearn, NLP to understand



eg. The chatcept, copilot etc

#### 3. Generative - Based

- · can generate novel nepponses on fly they learn pattern and language from massive datasets and construct unique neplies.
- eg a customen support bothhot can understand

  nuanced autotions like My delivery for

  ander #12345 in late, what Should I do? ' and

  provide a context aware inexpense automobics

  after making a APT call vitself

## 4. Retrieval -Based

- ond then cretrieve the most appropriate

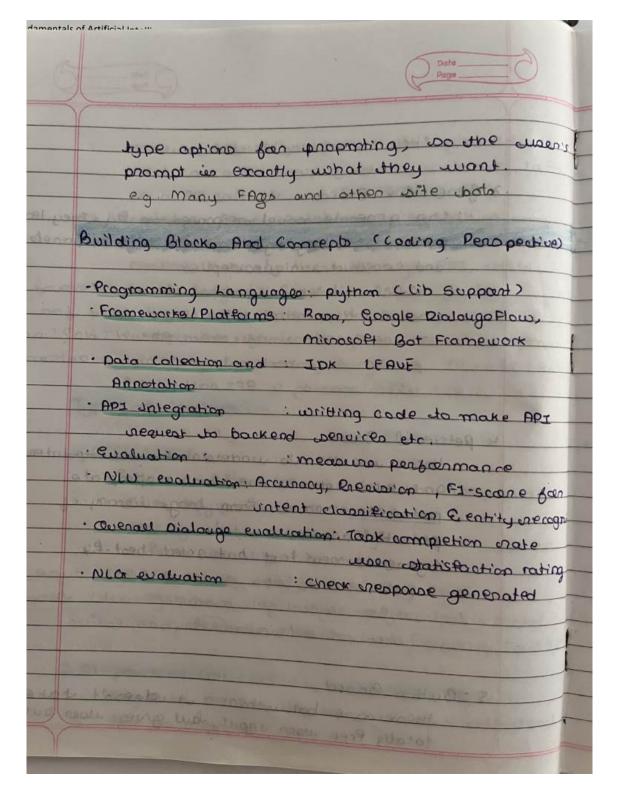
  pre-written answer from large library of

  potential answers.
- eg. Pictet thanks app on and other type

  where you get same (exact) response

  on some (similar cvery) question

# 5. Button Based there cane bot where it doesn't take totally free user input, but gives user button



Oate Page

Chatapy generative Pre-trained Transformer

Sophisticated lange danguage model CLLM)

- Core Tech: LLM and transformen Achitecture

5 LLM: neural network with billions of
panameters, trained on massive datasets

G Jest and code.

Stransformen Architecture: Specific neural
metwork architecture by Google in 2017,
which nevolutionized natural language
processing.

This uses (Affention) Mechanism:

models ability to weight the importance of alifferent worker in its bequence.

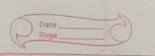
How it work?

- 1. Input: you provide tot (audio (voice) (doc
- 2. Tokenization: input text in broken down into smaller units called taken (it can be words, parts of words, punctuations etc)
- 3. Neural Network Processing: token are broken into numeric representation and fed into the Transfer neural metwork.

It processes it toget most appropriate sequence



4. Output Generation: generates on old sequence of takens, one by one, based on probabilities these tokens again - human credeable teats. Key capabilities and Use Capes 1. Text Generation doc generation 2. Code generation & Debugging ima/video generation 3. Summanization understanding 4. Translation notes making s. Creative writing to paiting come imme. Limitations and challenges 1. Hallucinations: can generate true assending but factually incorrect data. 2. Bigo : if training dataset if baised then cutcome can be biased. 3. Bugging & lego: can log and bug. 4. Ethical concerns issues arround misinformation, job alipplacement, copyaigne 5. mione 6. No contral



Recommendation Algorithm

usen preferences bratings.

goal is to Juggest nelevant items (personalized)

#### Needs

· solve unto overlood · reused expensione

·Tenagement, eneach · 13ales, content consumption

· enable discovery of new whems

## Core types

I. Content - Based Filtering

· necomendo itema similar to thane unen

· men item features + upen profile

" reson provie: build from explicit Cratings) an item wer interacted thively

· whemo features: each whem is calescribed by

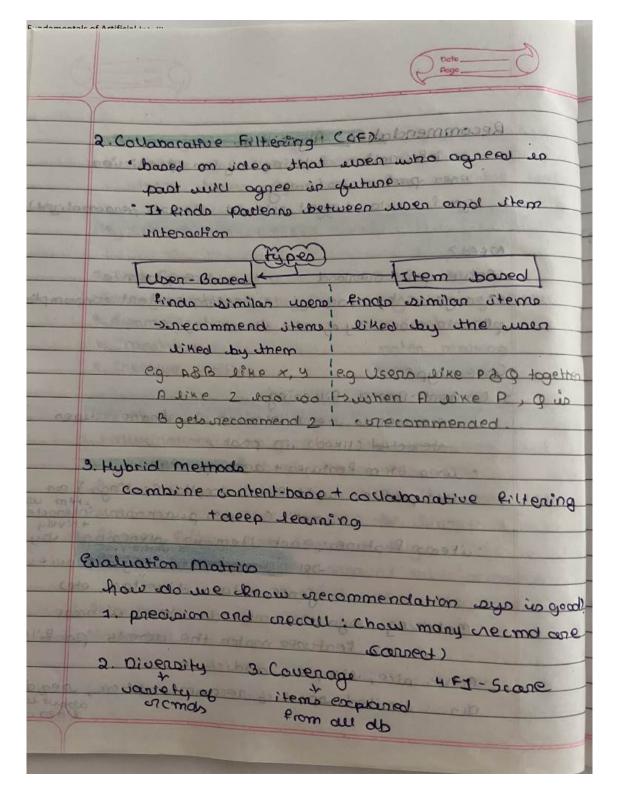
Det 06 attributes (e.g. movie:

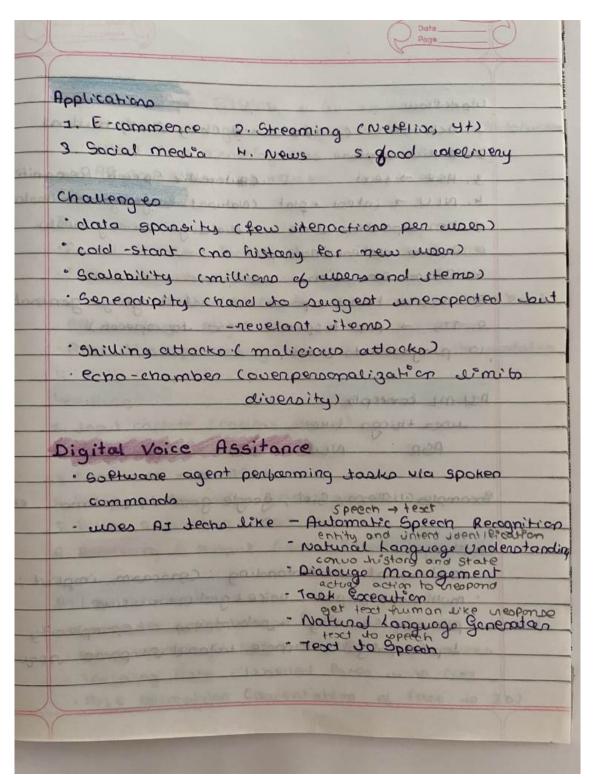
gence, actano, directar, etc)

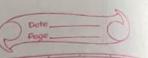
· Motching: syp enecommends items whose features match the user's profile

· Adu: nice; vimple; addictive

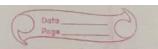
no : limited space of recommendation; regulato about user when...







# Work flow 1 activation (wake word they shri) 1 buttons 2. Audio capture contomatic Speech Recognition) 3. ASR > text 4. NLU -> intent + stat (Natural language understanden Calialange management) 5. bm updates estate 6. Action determination 7. Action execution 8. NICO -> text ener ponse (natural language generation) 9. TTS -> text to speech (text to appeach) 10. playback to upon. AII my concepts uses things like ASR NUMBER TO NICH TASIOICE Examples: Alexa, Siri, gaogle gamini, cortano Challenges · contextual understanding : Concasm, implicit inter · multimode input : voice + genture + vision · privacy (security · probustness · complexity · 1 bevoulgation c mare tayland restours redning)



# Virtual Face Filters

- real time digital averlays on force in photoluides · defect face + averlays (Cr I > blends seemlessly AR, snap Pilters, BG12 etc

#### Core Techo

- · Face Detection: locate face(s) in the frame
- · Facil Landmanh cletection: Key points on face

68 total => (eyes, nose, mouth, jawline letc)

- · AR overlay: Align COXI to face geometry
- Real time processing smooth align with updates

#### working

- (most a prince (camena stream)
- 2. Pace aletection
- 3. Andmark extraction
- 4.30 pape estimation (pitch, you, Nou)
- S. Pilter application (CCRI etc)
- 6. Rendering B output (video + filter combined)

## AIIML concepts

- · Computer vision: base field to interpret visuals
- · peop Leanning conn): defection + landmarks
- Training Data: labelled forces with CORT
- Pose estimation Conventation of face in 30)

