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VOICE-BASED SYSTEM ASSISTANT USING NLP AND DL

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Abstract:

Voice assistants have become an integral part of our daily lives, allowing natural and seamles s interaction with technology. Largescale linguistic models (LLMs), such as GPT3 and its suc cessors, have driven recent advances in language processing (NLP). This study investigates th e use of LLM in voice assistants to improve language understanding and response capabilities . This study provides a detailed analysis of existing research on LL.M. Our research aims to i nvestigate the effectiveness of graduate education in understanding users' complex questions and creating content for answers. Do well and use standard measurements. These tests compa re our LLMbased approach to a traditional voice assistant to measure the effectiveness and ef ficiency of the response. The results showed a significant improvement in language comprehe nsion and speech quality by integrating the LLM into the audio program. female gender. LL. M. Once good potential is demonstrated, issues arise such as calculating costs and making eth ical decisions. Additionally, future research directions are suggested, including methods to re duce sample size and optimize operational performance. . Integration of LL.M. It is changing the way users interact with voice technology, opening up new ways to create intelligent and c ontextaware voice assistants. By sharing code libraries in public repositories, we aim to enco urage collaboration and further research in this rapidly evolving field.

Introduction

Welcome to the world of artificial intelligence! In this project, we will create an artificial inte lligence based on the cuttingedge language GPT3 (Generative Prelearning Transformer 3). Th e AI assistant will understand and respond to the correct words in the text conversation. With their language understanding abilities, our AI assistants will be able to assist users with tasks ranging from answering questions to giving instructions. This project is a step towards a futur e where smart advisors will become an important part of our daily lives, helping us be efficie

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www.ijasem.org

Vol 18, Issue 1, 2024

nt and effective. We're excited to introduce you to this new technology and hope you enjoy it as much as we do! Do everything naturally. This AI assistant will be based on the GPT-3 language standard, which demonstrates good understanding of the language across a wide r ange of tasks. Use natural language processing (NLP) pipelines that can process and understa nd user input in the form of textbased conversations

1.1 Project Overview

In this project, we will create an intelligent advisor who can understand and respond to the co rrect messages in the conversation. The assistant will be based on the standard GPT-3 language and will be implemented using natural language processing (NLP) technology. Da ta collection and prioritization: This phase will involve collecting comprehensive interview d ata for training the GPT3 model. The collected data will be preprocessed and cleaned to ensur e that it is suitable for training the model. This will include steps such as tokenization, proven ance/lemmatization, part of speech tagging, and domain recognition. Model training: This ph ase will involve training the GP3 model on previous data. The model will be tuned to underst and and respond to user input in a consistent and contextually appropriate way. User interface integration: In this phase, the GPT3 training model will be integrated with an interactive inte rface (UI), allowing users to interact with the AIassistant through a conversation during discu ssion. The user interface will include features such as texttospeech synthesis and speech reco gnition for customer interaction. Evaluation: In the final stage, the effectiveness of the AI assistant will be evaluated based on its ability to understand and respond to user input, and its overall accuracy and usability will be evaluated. This will include user research and gatherin g feedback from users totest the effectiveness of the AI assistant. The model demonstrates lan guage comprehension ability across a wide range of tasks. This makes the AI assistant more f lexible, efficient and accurate compared to other existing systems that involve multiple model s in a single task. Create an intelligent advisor who can understand and respond to the right m essage in the conversation. The artificial intelligence assistant will be based on the GPT-3 language and the most advanced NLP technology. Use natural language processing (NLP) p ipelines that can process and understand user input in the form of text or speech. This include s tokenization, provenance/lemmatization, some of speech tagging, domain recognition, etc. I t will include steps such as. Finetune GP3 models of large discussion datasets to respond to u ser input in a consistent and contextual manner. Integrating the tweaked GPT3 model with th

ISSN2454-9940

www.ijasem.org

Vol 18, Issue 1, 2024

e interactive user interface (UI) allows users to interact with the AI assistant through chat or v oice effect.5 readers understand and evaluate its accuracy and validity. This will include user research and gathering feedback from users to test the effectiveness of the AI
assistant. Provide a platform that is easily customizable, scalable and adaptable to various do mains to meet various needs. There are like Amazon Alexa, Google Assistant and Apple Siri.

Artificial intelligence assistants will learn from user interactions, constantly improve themsel ves and provide personalized experiences to end users. Additionally, the program will try to measure the effectiveness of the AI
assistant compared to other AI assistants and human performance. -
3 and AI AssistantsDesign user interfaces for AI assistants
Teach AI assistants specific knowledge for target audiences
Use and test AI Assistant's language processing and understanding abilities
➞ Realize AI create and test in real time ability of the assistant to personalize responses base d on user interactions
➞ Measure and evaluate the performance of the AI assistant compared to other AIs based on assistant and human performance
™ Collect the results and prepare the final report on the expected results: < br > ™ Intelligent work assistant that can effectively understand and respond to user input
™ Intelligence assistance that can provide personalized assistance to users

Artificial Intelligence

Artificial Intelligence (AI) can play a role in gathering information and doing it well. Content aggregators can use artificial intelligence to speed up the process of collecting and curating c ontent from various sources. For example, AI systems can be trained to identify and categoriz e text based on specific content or topics, making it easier to organize and present content to users. . This can be done through the use of natural language processing technology (NLP), w hich allows computers to understand and analyze text in a similar way to humans. By training an AI model on large texts, it is possible to create a system that can identify the main points and main ideas of an article and summarize them, the shorter the content. Use intellectual skil ls. A big advantage is speed: AI machines can process and analyze a lot of content quickly an d effectively, allowing them to deliver a lot of information to users in a short time. AI can als

o help reduce the workload of content writers, allowing them to focus on more complex tasks or create content for more content. related to. As with any technology, it is important to caref ully evaluate the effectiveness and reliability of AI in the context of content collection and ag gregation before it is used in a production environment

Explanation of STT and TTS

Google TexttoSpeech is a machine developed by Google that converts written text into speeh. The technology uses cuttingedge machine learning to analyze and understand text, then gene rates speech in different languages and accents. The technology can be integrated into a variet y of apps and devices, including smartphones, tablets, smart speakers and more. Provide natu ral and human experience. Technology that converts text to speech makes it easier for users t o understand and interact with the system. It is also useful for people with dyslexia or who lik e to read by listening. and packaging. Additionally, the technology supports multiple languag es and accents, making it suitable for use in international markets. Apps that require voice res ponse. It is also useful for people with low vision as it can be used to provide explanations of visual content. Google texttospeech API. You pay according to usage, and the service has a di fferent price depending on the number of tokens (messages to access the API). It offers the us er a more comprehensive and useful experience in terms of speech. It is highly customizable, supports multiple languages and accents, and can be integrated into many applications and de vices.Google SpeechtoText is a wordreplacing technology developed by Google. Transcriptio n Uses advanced machine learning to analyze and understand speech, then convert it to text in multiple languages. The technology can be integrated into a variety of apps and devices, incl uding smartphones, tablets, smart speakers and more. . Users can speak their commands or qu estions rather than typing or choosing from fixed options; This is more efficient and less stres sful. allows developers to adjust the sensitivity and accuracy of speech recognition. It also su pports multiple languages and accents, making it suitable for use in international markets. Th e technology can also manage multiple speakers and assign time registers, allowing producers to determine which registers correspond to specific parts of the audio. The evolution of voice recording, handsfree control of IoT devices, and other applications that require speech recog nition. It is also beneficial for the deaf because it allows them to interact with the body throug h sound. Speak to text API. Like texttospeech, you pay by usage, and the service has different prices based on the cost of voice. Convert a word to text. It allows users to interact with the s

ISSN2454-9940

www.ijasem.org

Vol 18, Issue 1, 2024

ystem in a beautiful and intuitive way, is highly customizable, and supports different languag es and accents. It can be integrated into various applications and devices and can be a useful t ool for ease of use. This technology can be incorporated into your AI service to provide users with a more intuitive and human experience. Using text-to-
speech, the AI assistant can read the user's responses and make it easier for them to understan d and interact with the system. text. The technology can be used to instantly record a user's vo ice, allowing he AI assistant to understand and respond to the user's commands or questions. This integration allows users to better interact with the assistant and makes the assistant avail able on non-printing devices.Integration of Google Text-to-Speech and Speech-to-
Text can make AI smarter, efficient and effective. The Speech-to-
Speech feature can be used to read responses or alerts to the user, while the Speech-to-
Text feature records the user's voice, allowing the AI assistant to understand and respond to t he user's commands. or actually. -
it's time to ask. Using the GPT3 model, you can make your artificial intelligence assistant m ore efficient and effective by improving its language understanding and design abilities. Intell igence helps in writing audio content. It can help the hearing impaired or make audio content more accessible. Features are included in the project and you will be charged based on usage and it is not a free service. 3's texttospeech (TTS) and speeto-
text (STT) technology enhances the user experience by allowing voice conversations. STT te chnology converts speech to text. When combined with GPT3, the AI assistant can understan d voice input and respond to spoken words; This provides a more interactive and human expe rience. TTS and STT APIs such as Google Text-to-Speech, Amazon Polly or Google Speech-toText. These APIs can be integrated into your AI support functions by making API calls to T TS and STT services, passing text to speech or audio to be transcribed as input. You can then use GPT3 to generate responses to the user's voice input. GP3 can be integrated into projects using the OpenAI API, which allows you to make API calls to GPT-
3 services, pass scripts, and output. Read aloud by an AI assistant. By combining TTS, STT, and GPT3 in this way, you can create an AI assistant that understands speech, generates a res ponse using GPT3, and then speaks the language out loud. Address errors such as the STT A PI failing to correctly transcribe the user's speech or GPT3 failing to generate a response that

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Vol 18, Issue 1, 2024

makes sense in context. Addressing these errors will require additional work and design decis ions depending on the specific application and project requirements.

4. System Requirements

The specific requirements of your AI program will depend on the specific tools you choose to use and the size and complexity of the project. However, there are some general rules you sh ould consider:

1. Hardware: Depending on the complexity of your project and the number of users, you may need a server or server farm with sufficient processing power, memory, and storage. You ma y need the GPU to run some deep learning models or perform other intensive tasks. Executio n: You can use any operation supported by the technology you choose to use. Some popular o ptions include Linux, Windows and macOS. Software:

4. Programming language: You need a programming language that can be used to interact wit h the TTS, STT, and GPT3APIs. Options include Python, Node.js, and Java. Web framework : You will also need a web framework that can be used to create a user interface for AI assista nce. Some popular options are Flask and Express.js. TTS, STT, and GPT3 API: To access TT S, STT, and GPT3 features through the API, you need an API key or certificate to access thei r services. Database: If you plan to store user data such as preferences or history, you will nee d a database. Some of the popular options are MySQL, MongoDB and PostgreSQL. Network: Your system must have Internet access to make API calls to TTS, STT, and GPT3 services. Depending on the number of users and project size, you may need to use a load balancer to di stribute traffic across multiple servers. Cloud services: If you don't have the resources or expe rtise to host the necessary infrastructure, you may want to use cloud services such as AWS, G CP, or Azure to host your AI assistant. They can provide all the necessary infrastructure for t he project and you only pay for the resources you use. Features of your project. As you work on your project, you may find that you need additional tools or techniques to achieve your go als. Use them and make appropriate decisions when creating an AI assistant that will depend on the specific usage and requirements of your project. A project like an AI assistant will dep end on many factors, including the size of the project, the specific users, and the level of func tionality required. and GPU can work efficiently. Running the GPT-3 model requires a high- end GPU such as an NVIDIA A100 or RTX 3090. You will also need a computer with a lot o f memory because the GPT-3 format can require many gigabytes of memory to run. GPT-

3 formats can be very large and take up a lot of storage space, so you'll need a machine with more storage or you'll need to store the format on separate drives. A powerful CPU like Intel Core i9 or AMD Ryzen 9 with a fast clock speed and multiple cores would be a good choice t o run the GPT3 model. It is recommended to have at least 16GB for training the model of the machine. It's more expensive to run on your own machine. So, overall, it's good to have a ma chine that goes above and beyond the minimum you plan to use.

4.2 Software Requirements

For a project such as GPT-

3 based AI assistance, you should also consider some software requirements i n addition to the hardware requirements. Some important points to remember are:

1. Operation: GPT3 format can run on many operating systems, including Win dows, Linux and macOS. You should choose an operating system that is compa tible with the device you are using. Programming languages: The GP3 model c an be implemented using many programming languages, including Python, Jav a and C++. Python is a popular choice for working with GPT-

3 models due to its large ecosystem of machine learning and programming la nguages

and models. Required libraries: To complete the GPT3 model, you need to inst all several libraries, including the Hugging Face converter library and the OpenAI API wrapper. Also numpy, pandas, matplotlib etc. You will also need o ther commonly used libraries such as.

4. Development environment: Depending on your operating system and langua ge choice, you may need to install a development environment such as Anaco nda, Jupyter Notebook, Pycharm, or Visual Studio Code to work with your ri ghts. Version Control: The GPT3 model is constantly being updated and impro ved, so it is important to make sure you are using the latest version of the mo del. You just need the correct API key and login to run the model. Specific fu nctions and features that must be present, while nonfunctional requirements refer to general features and limitations. Below are some examples of two t ypes of requirements that a GPT-3-based AI assistant will need:

REFERENCES

Allen, I. E., & Seaman, J. (2008). ***Staying the course: Online education in the united states, 2008.*** ERIC.

Bambrick-Santoyo, P. (2010). ***Driven by data: A practical guide to improve instruction***. John Wiley & Sons.

Bates, D., Maechler, M., Bolker, B., & Walker, S. (2023). ***lme4: Linear mixed-effects models using eigen and S4***. https://github.com/lme4/lme4/

Betebenner, D. W. (2021). ***randomNames: Generate random given and surnames***. https://CenterForAssessment.github.io/randomNames

Bransford, J. D., Brown, A. L., Cocking, R. R., et al. (2000). ***How people learn*** (Vol. 11). Washington, DC: National academy press.

Breiman, L. (2001). Random forests. ***Machine Learning***, ***45***(1), 5–32.

Bryan, J. (2017). ***Project-oriented workflow***. https://www.tidyverse.org/blog/2017/12/workflow-vs-script/

Bryan, J. (2019). ***Reproducible examples and the 'reprex' package***. https://community.rstudio.com/t/video-reproducible-examples-and-the-reprex-package/14732

Bryan, J. (2020). ***Happy git with r***. https://happygitwithr.com/

Bryk, A. S., Gomez, L. M., Grunow, A., & LeMahieu, P. G. (2015). ***Learning to improve: How america's schools can get better at getting better***. Harvard Education Press.

Campaign, D. Q. (2018). ***Teachers see the power of data - but don't have the time to use it***. https://dataqualitycampaign.org/wp-content/uploads/2018/09/DQC_DataEmpowers-Infographic.pdf

Conway, D. (2010). The data science venn diagram. ***Drew Conway***, ***10***. http://drewconway.com/zia/2013/3/26/the-data-science-venn-diagram

Datnow, A., & Hubbard, L. (2015). Teachers' use of assessment data to inform instruction: Lessons from the past and prospects for the future. ***Teachers College Record***, ***117***(4), n4.

Dirksen, J. (2015). ***Design for how people learn***. New Riders.

Dweck, C. (2015). Carol dweck revisits the growth mindset. ***Education Week***, ***35***(5), 20–24.

Education Statistics U.S. Department of Education, N. C. for. (2019). Concentration of public school students eligible for free or reduced-price lunch. ***The Condition of Education 2019***. https://nces.ed.gov/fastfacts/display.asp?id=898

Elbers, B. (2020). ***Tidylog: Logging for dplyr and tidyr functions***. https://github.com/elbersb/tidylog/

Emdin, C. (2016). ***For white folks who teach in the hood... And the rest of y'all too: Reality pedagogy and urban education***. Beacon Press.

Estrellado, R. A., Bovee, E. A., Motsipak, J., Rosenberg, J. M., & Vel'asquez, I. C. (2019). ***Taylor and francis book proposal for data science in education***. https://github.com/data-edu/DSIEUR_support_files/blob/master/planning/T%26F%20Book%20Proposal%20for%20Data%20Science%20in%20Education.docx

Estrellado, R., Bovee, E., Mostipak, J., Rosenberg, J., & Vel'asquez, I. (2024). ***Dataedu: Package for data science in education using r***. https://github.com/data-edu/dataedu

Firke, S. (2023). ***Janitor: Simple tools for examining and cleaning dirty data***. https://github.com/sfirke/janitor

for Education Statistics, N. C. (2018). ***Public elementary/secondary school universe survey***. https://nces.ed.gov/programs/digest/d17/tables/dt17_204.10.asp?current=yes

Gelman, A., & Hill, J. (2006). ***Data analysis using regression and multilevel/hierarchical models***. Cambridge university press.

Grimm, K. J., Ram, N., & Estabrook, R. (2016). ***Growth modeling: Structural equation and multilevel modeling approaches***. Guilford Publications.

Hastie, T., Tibshirani, R., & Friedman, J. (2009). ***The elements of statistical learning: Data mining, inference, and prediction***. Springer Science & Business Media.

Hattie, J. (2012). ***Visible learning for teachers: Maximizing impact on learning***. Routledge.

Healy, K. (2019). ***Data visualization: A practical introduction***. Princeton University Press.

Hill, A. (2017). ***Up and running with blogdown***. https://alison.rbind.io/post/2017-06-12-up-and-running-with-blogdown/

Hirschberg, J., & Manning, C. D. (2015). Advances in natural language processing. ***Science***, ***349***(6245), 261–266.

Ismay, C., & Kim, A. Y. (2019). ***Statistical inference via data science***. CRC Press.

James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). ***An introduction to statistical learning*** (Vol. 112). Springer.

Jarvis, C. (2019). ***Creating calling***. HarperCollins.

Jordan, R. (2015). ***High-poverty schools undermine education for children of color***. https://www.urban.org/urban-wire/high-poverty-schools-undermine-education-children-color Kahneman, D. (2011). ***Thinking fast and slow***.

Kearney, Michael W. (2016). Rtweet: Collecting twitter data. ***Comprehensive R Archive Network. Available at: Https://Cran. R-Project. Org/Package= Rtweet***.

Kearney, Michael W., Revilla Sancho, L., & Wickham, H. (2023). ***Rtweet: Collecting twitter data***. https://docs.ropensci.org/rtweet/

Kleon, A. (2012). ***Steal like an artist: 10 things nobody told you about being creative***. Workman Publishing.

Kozol, J. (2012). ***Savage inequalities: Children in america's schools***. Broadway Books.

Krist, C., Schwarz, C. V., & Reiser, B. J. (2019). Identifying essential epistemic heuristics for guiding mechanistic reasoning in science learning. ***Journal of the Learning Sciences***, ***28***(2), 160–205.

Kuhn, M. et al. (2008). Building predictive models in r using the caret package. ***Journal of Statistical Software***, ***28***(5), 1–26.

Kuhn, M. (2023). ***Caret: Classification and regression training***. https://github.com/topepo/caret/

Kurz, S. (2019). ***Statistical rethinking with brms, ggplot2, and the tidyverse***.