

CHAT BOT DESIGN USING CHATGPT ALGORITHMS AND ITS EFFECTS ON EDUCATIONAL ACADEMIES

Tiep, Nguyen Tai

Technology Department, Dong Nai Technology University, Dong Nai, Viet Nam

Tel: 84 989 415 368 E-mail: nguyentaitiep@dntu.edu.vn

Abstract

AI and GPT technology could have a huge impact on academia and libraries. AI could be used to automate certain tasks, such as cataloguing books, organizing research materials, and providing personalized recommendations to patrons. GPT could be used to generate research articles, abstracts, and literature reviews; and to run simulations, natural language processing, and other sophisticated tasks. It could also be used to facilitate collaboration between researchers and libraries, by providing tools to store, analyze, and share research data. Libraries could use AI and GPT to create virtual interactive collections, to provide personalized guidance to patrons, and to develop new services. In addition, AI and GPT could be used to enhance existing services, such as providing answers to patrons' questions, providing personalized book recommendations, and tracking library usage.

Keywords: Artificial Intelligence Algorithms; Chatgpt, Gpt-3, Generative Pre-Trained Transformer, Educational

DOI: 10.7176/ALST/97-05

Publication date: April 30th 2023

1. Introduction

Artificial intelligence (AI) algorithms and chatbots are becoming increasingly popular in educational academies as they are utilized to help facilitate learning. AI algorithms are used to provide personalized learning experiences, while chatbots are used to provide answers to student questions [1].

GPT (Generative Pre-trained Transformer) is a deep learning algorithm developed by OpenAI and released in 2019. It is a natural language processing (NLP) system that is able to generate human-like text from a given prompt. GPT has been used in educational settings to generate personalized learning experiences. By providing students with tailored lessons and personalized interactions, GPT can help students learn more effectively and increase their engagement with the material [2-3].

The use of GPT in educational settings has the potential to revolutionize the way students learn. GPT can provide a more personalized learning experience and help students better understand and retain the material. Additionally, GPT can be used to create new and innovative approaches to teaching and learning. For example, GPT can be used to create more engaging and interactive learning experiences, such as virtual tutoring and personalized lesson plans [2-4].

Overall, GPT and other AI algorithms have the potential to be highly beneficial to educational academies. These algorithms can help improve the learning process by providing personalized learning experiences and allowing students to interact with the material in new and innovative ways. However, it is important to be aware of the potential drawbacks of using AI in educational settings [5]. For example, AI algorithms can be limited in their ability to provide personalized learning experiences or may be biased or inaccurate in their results. Additionally, AI algorithms can be expensive to implement and maintain [6].

Despite these potential drawbacks, the potential benefits of using GPT and other AI algorithms in educational settings are clear. These algorithms can provide personalized learning experiences and help students better understand and retain the material. Additionally, GPT can help create more engaging and interactive learning experiences. As AI algorithms become increasingly sophisticated, they will continue to be used to improve the educational experience for students [7-8].

1. ChatGPT effects on educational academies

The study of artificial intelligence algorithms and chatGPT (Generative Pre-trained Transformer) and its effects on educational academies has become increasingly popular in recent years. ChatGPT is a type of artificial

intelligence algorithm that is based on natural language processing (NLP) and is designed to generate human-like conversations. It is widely used in educational institutions to assist in tutoring and teaching, as well as to provide personalized learning experiences [9].

The use of chatGPT in educational academies has many potential benefits. First, it can help students to better understand the material and to quickly comprehend new concepts. This is especially beneficial for students who struggle to learn and remember information. Second, chatGPT can reduce the need for traditional tutoring, which can help to reduce the cost of instruction. Finally, chatGPT can be used to provide students with personalized feedback, which can help to improve their learning outcomes [10].

However, there are also potential risks associated with the use of chatGPT in educational academies. For example, chatGPT may not always provide accurate information, which could lead to misunderstandings or incorrect information being given to students. Additionally, if the chatGPT is not properly designed, it may not be able to provide personalized feedback, which could lead to a lack of engagement with the material. Finally, chatGPT may not be able to respond to complex questions, which could lead to frustration for students [11].

Overall, the use of chatGPT in educational academies has the potential to be a powerful tool for learning. However, it is important to consider the potential risks associated with its use and to ensure that it is properly designed and monitored [9-12].

2. Design model

Step 1. Gather Requirements: The first step in designing a chatbot is to gather the requirements. This includes understanding the purpose of the chatbot, the type of conversation it should have with the user, and the skills it should have, shown in figure 1

Step 2. Choose Platform: After gathering the requirements, the next step is to choose a platform which will support the development of the chatbot. This includes selecting a platform that supports the development language, frameworks, and other tools required for the chatbot.

Step 3. Design Conversation Flows: After selecting the platform, the next step is to design the conversation flows. This includes designing the conversation for the chatbot and making sure the conversation follows a logical flow.

Step 4. Develop the Bot: After designing the conversation flows, the next step is to develop the chatbot. This includes coding the chatbot using the platform and language selected.

Step 5. Test and Deploy: After developing the chatbot, the next step is to test it to make sure it works as expected and then deploy it. This includes making sure the chatbot is able to respond to the user's queries in a timely manner.

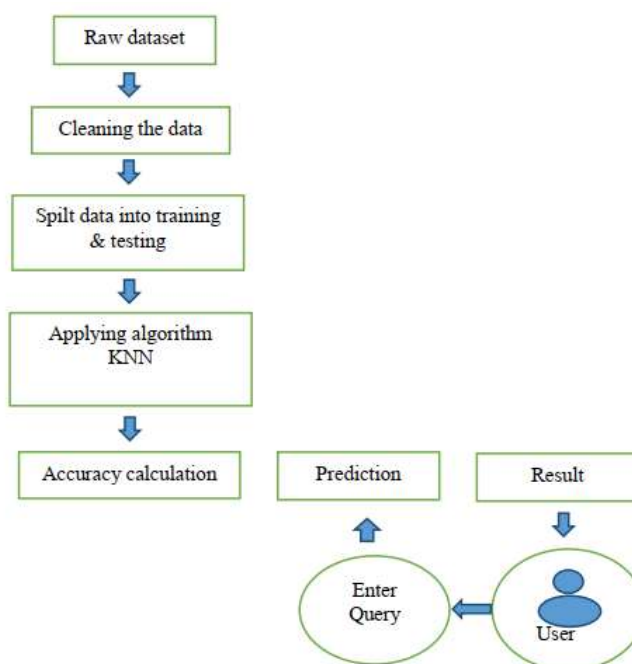


Figure 1: The design model

3. Block Diagram of design model

The first step in organizing the dataset is to identify the columns and rows. The columns should be labeled according to the data they contain. For example, the first column could be labeled "Question" and the second column could be labeled "Answer". The third column can be labeled "Category" and can contain the name of the category that the question belongs to. The next step is to sort the data by category. This can be done using the "Sort" function in Excel. Select the "Category" column, then click the "Sort A to Z" button. This will organize the data by category, making it easier to analyze. The third step is to identify trends in the data. This can be done by creating pivot tables and charts. Pivot tables will allow you to quickly analyze the data and identify any patterns or trends. Charts can be used to visualize the data and make it easier to identify patterns. Finally, the data can be analyzed using machine learning techniques. Machine learning algorithms can be used to predict outcomes based on the data. This can help in the admissions process by better predicting which applicants will be successful.

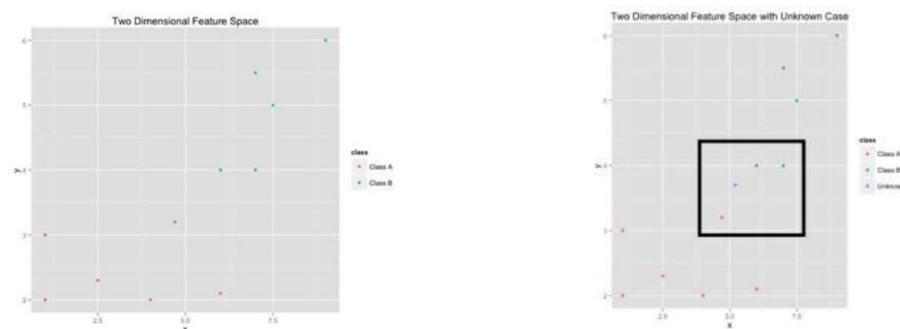
- **Data Cleaning:** The next step is to clean the data in order to make sure it is reliable. This involves removing stop words, typos, and other errors. Additionally, we must ensure that the data is free of any unwanted characters or symbols.
- **Data Transformation:** After the data is cleaned and formatted, the next step is to transform it into a machine-readable form. This involves converting it into a numerical format so that the machine can process it. We used the Scikit-Learn library to encode the text into numerical values.
- **Model Training:** After the data is transformed into numerical values, we can begin to train the model. We used a gradient boosting algorithm to train the model on the data. The model is then tested on a test set to evaluate its performance.
- **Model Evaluation:** The performance of the model is evaluated using various metrics such as accuracy, precision, recall, and F1 score. With these metrics, we can determine how well the model is performing.
- **Model Deployment:** Finally, the model is deployed in production, where it can be used to make predictions on unseen data. We used a Flask application to deploy the model and make predictions.

Other vectorization methods include bag of words, n-grams, word embeddings, and one-hot encoding. Bag of words is a method of representing text as numerical feature vectors. It takes into account the frequency of words in a document and ignores the order of words. N-grams are a combination of consecutive words used to represent text. Word embeddings are a set of numerical values that represent a particular word, and one-hot encoding is a method of representing words as a series of 0s and 1s.

4. Result

The algorithm is known as the k-nearest neighbors algorithm, and it is a popular machine learning algorithm used for classification tasks. The idea is to find the k-nearest neighbors of a particular data point and use the class of these neighbors to predict the class of the data point, shown in Figure 2.

The 'status' command is a great way to get a quick overview of the model and its performance so far. It allows users to quickly see the number of training cases, classes, and K value as well as the status of the bot. The 2D plot displays the feature space, which can help users identify patterns and clusters in the data. This is particularly useful when visualizing the performance of a KNN model.



(a) Graph of Two-Dimensional Feature Space (b) Graph of Two-Dimensional Feature Space with Unknown Case

Figure 2. Graph of Dimensional Feature Space

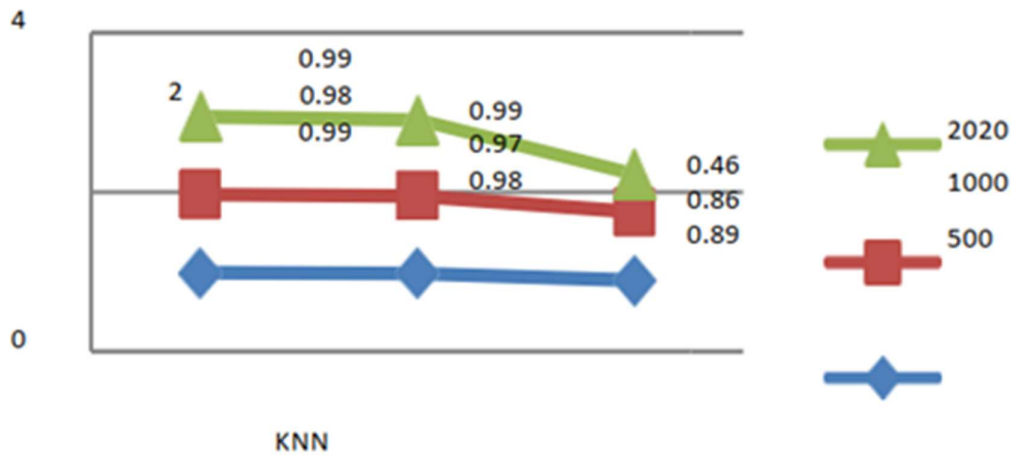


Figure 3. Accuracy of model using different of data sets

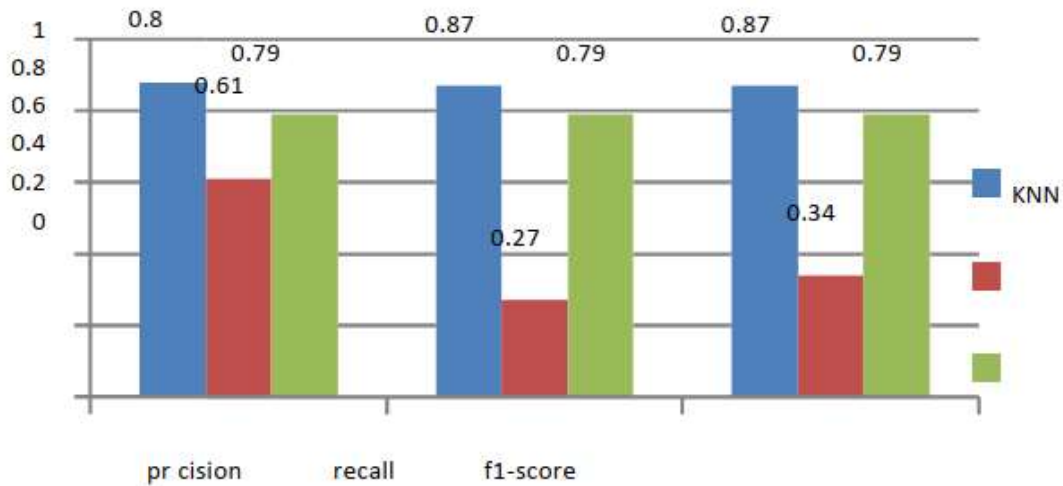


Figure 4. Macroaverage

The accuracy of a model using different data sets can vary significantly depending on the type of data, the size of the data set, the complexity of the model, and other factors, shown in Figure 3 and Figure 4. In general, models that are trained on larger, more complex data sets tend to have higher accuracy than models trained on smaller, simpler data sets. Additionally, models trained on specific types of data (e.g. image data or text data) may have different accuracy results than models trained on other types of data.

Macroaverage accuracy is an effective way to compare the accuracy of different models on different data sets. Macroaverage accuracy measures the average accuracy across different categories or classes, which can be useful for determining the overall performance of a mode

Table 1: Accuracy of Algorithm

Test	Set Accuracy
	KNN-Chat GPT
400	0.85
800	0.78
1500	0.45

Table 2: Accuracy of KNN-Chat GPT

b	Algorithm	Accuracy
1	KNN-Chat GPT	0.57813546

5. Conclusion

The benefits of implementing chatbots in Yioop include increased user engagement and satisfaction, improved customer service, and streamlined communication. Additionally, chatbots can help automate mundane tasks, such as creating accounts, logging into websites, and making purchases. Additionally, chatbots can be used to provide customized and personalized experiences for users. Finally, chatbots can help reduce costs by eliminating the need for customer service representatives. The users will be able to interact with the chatbot by asking questions, and the chatbot will respond with an answer. The chatbot will understand the meaning of the user's query, and provide an appropriate response. To accomplish this, I will use natural language processing (NLP) and machine learning (ML) algorithms. The chatbot will be able to understand and respond in natural language. The chatbot will be able to understand the intention of the user's query and respond appropriately. The chatbot will also be able to learn from its interactions with users, using ML algorithms. This will allow the chatbot to become more responsive and accurate over time.

In conclusion, I implemented a simple chatbot into Yioop. I was able to configure and create accounts for both users with bot settings, as well as implementing a simple weather chatbot. In the future, I plan to improve the capabilities of the chatbot by allowing it to interact with a large number of human and bot users, and to remember and learn from previous talks. The benefits of chatbots in Yioop include increased user engagement and satisfaction, improved customer service, and streamlined communication.

6. Reference

1. Cotton, Debby RE, Peter A. Cotton, and J. Reuben Shipway. "Chatting and Cheating. Ensuring academic integrity in the era of ChatGPT." (2023).
2. Taecharungroj, Viriya. "'What Can ChatGPT Do?'" Analyzing Early Reactions to the Innovative AI Chatbot on Twitter." *Big Data and Cognitive Computing* 7, no. 1 (2023): 35.
3. Rudolph, Jürgen, Samson Tan, and Shannon Tan. "ChatGPT: Bullshit spewer or the end of traditional assessments in higher education?." *Journal of Applied Learning and Teaching* 6, no. 1 (2023).
4. Wang, Fei-Yue, Qinghai Miao, Xuan Li, Xingxia Wang, and Yilun Lin. "What does chatGPT say: the DAO from algorithmic intelligence to linguistic intelligence." *IEEE/CAA Journal of Automatica Sinica* 10, no. 3 (2023): 575-579.
5. Khalil, Mohammad, and Erkan Er. "Will ChatGPT get you caught? Rethinking of Plagiarism Detection." arXiv preprint arXiv:2302.04335 (2023).
6. Zhai, Xiaoming. "ChatGPT user experience: Implications for education." Available at SSRN 4312418 (2022).
7. Mbakwe, Amarachi B., Ismini Lourentzou, Leo Anthony Celi, Oren J. Mechanic, and Alon Dagan. "ChatGPT passing USMLE shines a spotlight on the flaws of medical education." *PLOS Digital Health* 2, no. 2 (2023): e0000205.
8. Haleem, Abid, Mohd Javaid, and Ravi Pratap Singh. "An era of ChatGPT as a significant futuristic support tool: A study on features, abilities, and challenges." *BenchCouncil Transactions on Benchmarks, Standards and Evaluations* (2023): 100089.
9. Tlili, Ahmed, Boulos Shehata, Michael Agyemang Adarkwah, Aras Bozkurt, Daniel T. Hickey, Ronghuai Huang, and Brighter Agyemang. "What if the devil is my guardian angel: ChatGPT as a case study of using chatbots in education." *Smart Learning Environments* 10, no. 1 (2023): 15.
10. Opara, Emmanuel, Adalikwu Mfon-Ette Theresa, and Tolorunleke Caroline Aduke. "ChatGPT for Teaching, Learning and Research: Prospects and Challenges." Opara Emmanuel Chinonso, Adalikwu Mfon-Ette Theresa, Tolorunleke Caroline Aduke (2023). *ChatGPT for Teaching, Learning and Research: Prospects and Challenges. Glob Acad J Humanit Soc Sci* 5 (2023).
11. Mhlanga, David. "Open AI in Education, the Responsible and Ethical Use of ChatGPT Towards Lifelong

- Learning." Education, the Responsible and Ethical Use of ChatGPT Towards Lifelong Learning (February 11, 2023) (2023).
12. Luan, Lingfei, Xi Lin, and Wenbiao Li. "Exploring the Cognitive Dynamics of Artificial Intelligence in the Post-COVID-19 and Learning 3.0 Era: A Case Study of ChatGPT." arXiv preprint arXiv:2302.04818 (2023).
 13. D. Novalindry and N. Hakim, "Development of A Tracer Study Information System In Senior High School with Devops Method Using Python Application and Django Framework", JTIP, vol. 15, no. 1, pp. 96-104, Sep. 2022.
 14. D. Novalindry and N. Putri, "Design and Build a Photo Studio Marketplace using the Codeigniter Framework", JTIP, vol. 14, no. 1, pp. 18-26, Apr. 2021.