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AI based virtual learning assistant

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Abstract

The AI based Virtual system has a teaching platform that uses artificial intelligence. This platform is about Data Science. It has teachers that are experts in specific subjects like Python and SQL. These teachers can also teach Exploratory Data Analysis and Machine Learning. The virtual teachers are made to be experts in their subjects. They can give answers to questions that students ask. The platform lets students talk to these teachers one on one. If a student has a question that involves than one subject the system can still help. It brings in teachers that know about the other subjects. This system is made to be big. Can handle a lot of students. It is starting with Data Science. It can add more subjects later. The idea is to make a learning place where students can get help from these teachers anytime they want. The system wants to make learning personal and easy to understand. Students can use it to learn at their pace. The Data Science platform is the start and more subjects will be added to make it even better.

Keywords: Teaching Platform; One on one; Exploratory Data Analysis; Machine Learning; Python; SQL.

1. Introduction

The platform uses intelligence to teach Data Science. It helps students learn by providing guidance through lecturers. Students can pick a subject. Talk to the AI like they would with a friend. They get explanations that make sense when they ask questions. This platform is not like learning methods. It lets students learn at their pace and access the material anytime they want. They can also see how different topics are connected. This helps students understand concepts better. The platform combines interaction, with lessons. The goal is to make learning fun and flexible. It uses AI lecturers to teach Data Science. The platform wants to help students stay engaged and get results. By doing this it helps students learn Data Science effectively. The platform provides a learning environment. It supports learning at their pace and access to material all the time. Students can learn Data Science in a fun and interactive way.

2. Literature survey

2.1. A Framework for Adapting Conversational Intelligent Tutoring Systems to Enable Collaborative Learning (2025) - Pablo Arnau-González, Sergi Solera-Monforte, Yuyan Wu, Miguel Arevalillo-Herráez

The paper is about changing Intelligent Tutoring Systems so they are like classrooms where people can learn together. It uses a kind of setup with layers and something called a shared object or CSSO for short to help people talk to each other right away. They used the HINTS system to make this work. Intelligent Tutoring Systems are changed into places where students can work on problems together. The only bad thing is that it takes a longer to get an answer when you ask a question. Intelligent Tutoring Systems are, like classrooms now where students can learn together and solve problems as a team.

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2.2. Artificial Intelligence (AI) in Education: Using AI Tools for Teaching and Learning Process (2021) - Tira Nur Fitria

The paper talks about how Artificial Intelligence helps make education better with things, like mentors, automated assessment and personalized learning. This makes education more efficient and easier to access. The paper also says that Artificial Intelligence cannot take the place of human teachers. Artificial Intelligence should only be used to help teachers not replace them.

2.3. ChatGPT and the Evolution of AI-Powered Tutoring Systems (2025) - Dinesh Deckker, Subhashini Sumanasekara

The paper looks at how AI tutoring systems have changed over time. It talks about how ChatGPT helps people learn in a way that's just, for them. ChatGPT gives real-time learning. Makes learning more interesting. The paper also discusses some problems. These problems include ethics keeping data private and relying much on AI. The paper says we need to use ChatGPT in a way. This means using ChatGPT alongside teachers. Human teachers and ChatGPT can work together. This can make learning for everyone. The paper wants to make sure AI is used in a way. ChatGPT and AI are changing how we learn.

2.4. Conversational AI in Education: A General Review of Chatbot Technologies and Challenges (2025) - Wasin Alkishri, Jabar H. Yousif, Yousuf Nasser Al Husaini, Mahmood Al-Bahri

The paper looks at chatbot technologies in education. It shows how chatbot technologies support tutoring and assessment. Chatbot technologies also support learning that is available all the time.The paper talks about the challenges of chatbot technologies too. These challenges include ethics and privacy and infrastructure. The paper says that chatbot technologies need to be designed and integrated with human teaching. This is important for chatbot technologies, in education to work well.

2.5. Intelligent Tutoring System (ITS): Its Applications and Challenges in Higher Education (2025) - Babli Choudhury

The paper looks at Intelligent Tutoring Systems in education. It shows how Intelligent Tutoring Systems help students learn in a way that is tailored to them. This is really helpful for subjects that need a lot of practice.Intelligent Tutoring Systems can also help students do better in these subjects. The paper talks about some problems with Intelligent Tutoring Systems too. For example they can be expensive. Some teachers do not like Intelligent Tutoring Systems. Schools need to have the equipment, for Intelligent Tutoring Systems to work. The paper says that Intelligent Tutoring Systems should work with teaching not take its place. Intelligent Tutoring Systems are meant to help teachers not replace them.

Objectives

The primary objectives of this project include:

- The main goal of the system is to create a teaching platform that uses intelligence to help people learn about Data Science.
- This platform will let students pick a subject and talk to AI teachers who will give them accurate explanations.
- The system wants to help students understand concepts by having conversations with them which will make learning fun and easy to do.
- Another goal of the system is to help people learn at their pace by giving them access to help whenever they need it without having to wait for a teacher.
- The system also wants to be able to answer questions about Data Science topics in a way that makes sense so people can keep learning about subjects without getting confused.
- The system will also keep track of what people have learned about Data Science and try to give them an experience.
- The system will be able to grow to help more people learn about subjects in the future like Data Science and this will be very useful, for people who want to learn about Data Science.

2.6. System architecture

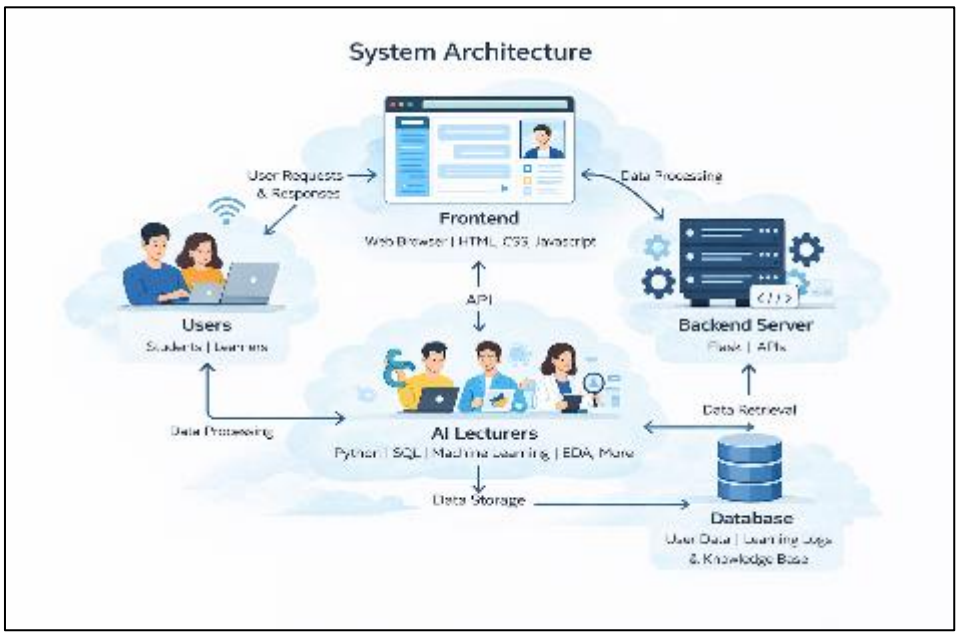

Figure 1 System Architecture

The system architecture is what defines how all the parts of the AI-powered virtual teaching platform work together. This includes the users, the frontend, the backend server, the AI lecturers and the database. They made it in a way that it can be added to or changed easily so it can handle a lot of users and information.

When users want to do something on the platform they use a website to interact with it. The frontend is what they see. It sends their questions to the backend server and shows them the answers. The backend server then looks at what the users want to do manages their sessions and sends them to the AI lecturer based on what subject they are learning.

The AI lecturers are what give the users the information they need. They know a lot about the subject the user is learning. The database is where all the information, about the users and what they do on the platform is stored. So the system makes it easy for all the parts to work together. This helps users learn and get the support they need in real time with the AI-powered virtual teaching platform and the AI lecturers and the database all working together.

3. Proposed methodology

3.1. Subject Selection and Interface Design

The first step is to create a website where students can easily choose topics like Python, SQL, Machine Learning and EDA. The website layout should be easy to understand so that students can navigate and communicate with others. This part of the system is where users select their subject and submit their questions. They will pick subjects, like Python, SQL, Machine Learning and EDA. Then ask their questions.

3.2. Query Input and Preprocessing

When we pick a subject the system lets us ask questions in writing through the interface. The system then looks at what we wrote and makes it cleaner and easier to understand by getting rid of stuff and making it clearer. This helps make sure the question is, in a format for the system to look at it more closely and figure out what the user is asking about the subject.

3.3. Query Analysis and Lecturer Mapping

We take a look at what the user's asking for and try to find the important words. The system then sends the request to the AI Lecturer module that deals with the subject the user is asking about and what the question is about. If the user is asking about, than one thing the system gets help from other AI Lecturers who know about the other topics the user is

asking about the AI Lecturers and the system work together to provide a good answer to the users question about the subject.

3.4. Response Generation and System Update

The AI Lecturer generates a context response based on the query from the user. This response is then. Shown to the user in a way that feels like a conversation through the interface. At the time the system is updating the session data and saving the details of the interaction in the database. This is done so that the AI Lecturer can keep track of the learning history and make the AI Lecturer responses better, in the future when the user asks the AI Lecturer something.

4. Algorithm

The main system flow of the AI based virtual learning platform is like a set of steps that work together. These steps include picking a subject processing a question coming up with an answer and managing data.

Here is how it works:

- The platform gets the subject the user wants to learn about, like Python or Machine Learning and the user says they are ready to ask a question.
- The platform then starts a session with the user and loads the right AI teacher for that subject.
- The user types their question into the website. The platform gets that question.
- The platform cleans up the question makes it nice and neat and gets it ready to be looked at.
- It looks at the question to figure out what the user wants finds the words and decides what kind of question it is.
- The platform sends the cleaned-up question to the AI teacher. If the question is many things it talks to other teachers too.
- The AI teacher comes up with an answer that makes sense and is about the subject.
- The platform makes the answer look nice and easy to read before sending it to the user.
- The answer shows up on the website. It looks like the user is having a conversation.
- The platform saves the question the answer and what the user did so it can use that later.
- It updates what it knows about the user and what they have done so it can be more helpful time.
- If the user asks another question the platform does it all again. If not it ends the session. Saves what happened.

5. Result

Figure 2 Choose of Lecturer

Figure 3 Choose of Lecturer

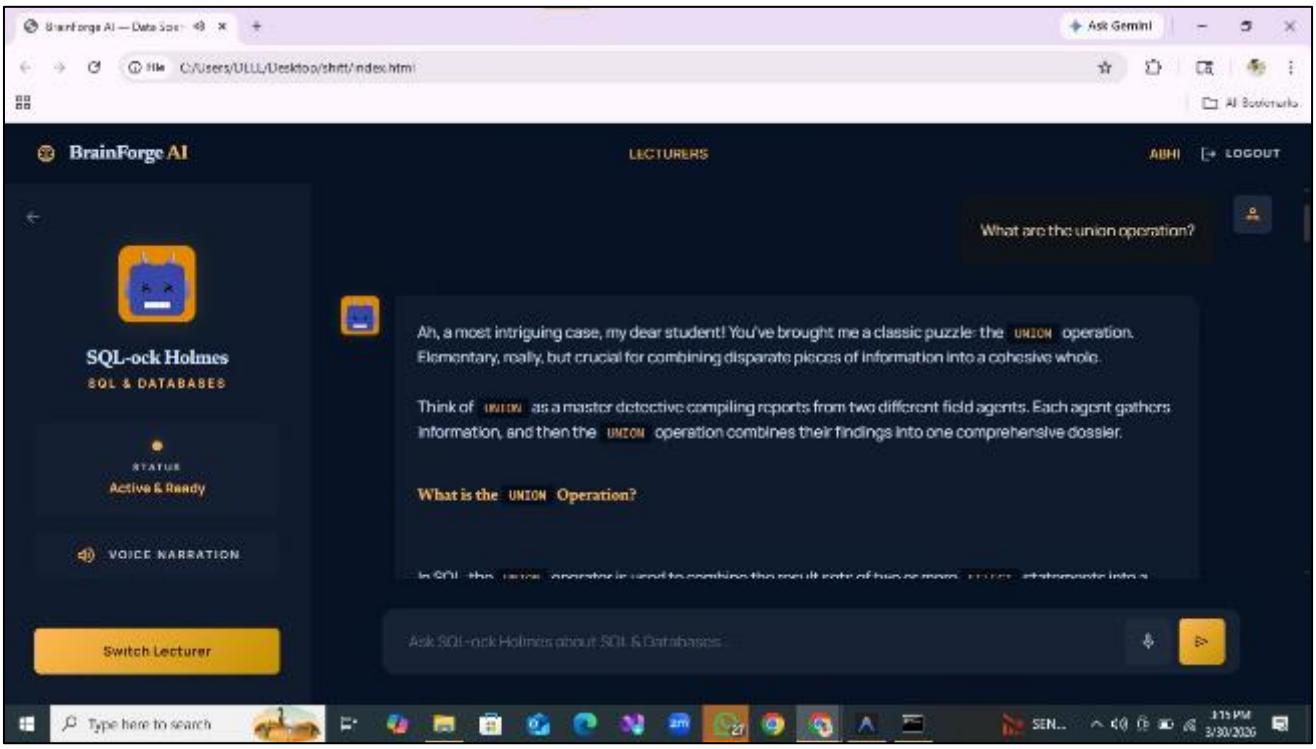

Figure 4 Output to the query

6. Conclusion

The Data Science platform is a way to make learning by using teachers that are actually computers. It helps students pick what they want to learn and talk to the computer teachers through a chat. Students get answers that make sense when they ask the computer teachers a question. This way of learning lets students go at their pace and get help when they need it. The Data Science platform fixes some problems with the way of learning like when teachers do not have time for each student and classes are not tailored to each student. The Data Science platform shows how important it is to have interactive ways of learning. It can answer questions about topics keep track of what students do and give answers that always make sense. This helps students understand and want to learn more about the Data Science

platform. The Data Science platform can. Change to help more students and add new things. The Data Science platform is a step towards making learning systems that're flexible and focus on students. It can make learning more about the students, in the future. Help them learn more about Data Science.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

References

[1] Pablo Arnau-González, Sergi Solera-Monforte, Yuyan Wu, Miguel Arevalillo-Herráez (2025). A Framework for Adapting Conversational Intelligent Tutoring Systems to Enable Collaborative Learning

[2] Tira Nur Fitria (2021). Artificial Intelligence (AI) in Education: Using AI Tools for Teaching and Learning Process

[3] Dinesh Deckker, Subhashini Sumanasekara (2025). ChatGPT and the Evolution of AI-Powered Tutoring Systems

[4] Alkishri, Jabar H. Yousif, Yousuf Nasser Al Husaini, Mahmood Al-Bahri (2025). Conversational AI in Education: A General Review of Chatbot Technologies and Challenges

[5] Babli Choudhury (2025). Intelligent Tutoring System (ITS): Its Applications and Challenges in Higher Education