

AIT: Artificial Intelligence Teacher (Replacing Teachers with Technology)

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Abstract: *This project is the key for changing the method of education. This paper solves a major problem in our daily life and it looks into a whole new variety of technologies that could be developed. This project is basically an Artificial Intelligence Teacher that aims to help students in education, we are trying to make it present information quickly, to provide individual attention to the student and motivate the student, this project aims at replacing the actual teacher, as A.I has a lot of potential in this sector, and if executed properly, this would solve a major problem in our daily life. This paper provides a glimpse of the technology and it shows how A.I can actually assist us in education and help make a better world.*

Keywords: Python, A.I.T, Students, Education, Django Web Framework

1. Introduction

This paper aims to solve an important problem in our daily lives. It provides a step into what A.I can do in the education sector, it can help all the people in the world, especially in poor countries, where education is limited and not found easily. The solution Presented here solves a major problem for students in schools or colleges. Unlike other tools in education, this system acts as a teacher, who guides student in every aspect, it creates a virtual environment for students where the teacher is the virtual assistant, and helps in all cases. It provides assignments, conducts monthly tests and presents a score card also, everything that a teacher does but the twist here is that this teacher is never tired nor it complains, it learns while we interact with it and provides an interactive and fun learning environment for the students.

According the many research papers (given in section 8 of the paper), the impact of A.I on education is tremendous, An Intelligent system is a system that presents the information quickly and efficiently, it provides individual attention, and motivates the children.

We have to think through a broad perspective and not limit ourselves, we should keep inventing as Artificial intelligence is new and there is lots to explore, and we as human beings must learn to seek new things and utilize them in our interests and create a better world.

Questions answered in this paper are:

- Is this type of software possible?
- How will it benefit people?
- What are the possibilities?
- What were the results of the demo application?
- Conclusion and Future direction

2. Problem Definition

The main problem in the world is lack of education and teachers. People are not educated in rural Ares that is why there is no development there. There are very few teachers available there, and many teachers are not willing to put the effort to teach all the students, as they are humans and they

become tired.

To resolve this problem, we propose a solution, which involves building of an Artificial Intelligence Teacher, A.I.T for short that aims to solve this problem by acting as a virtual teacher that is quick and gives individual attention to students without getting tired.

We are in the 21st century, where technology is everywhere, students respond better to mobile applications, websites, as a result they learn, we can imagine what technology (A.I) can do to the education sector, and then how prosperous can our country become if we start investing in human resources.

We should let machines teach rather than humans, this thought is a very deep and bold thought, as no one can imagine a Artificial Intelligence Teacher teaching students and helping them in their doubts.

Our main aim is to **build machines that present the information quickly and efficiently, that provides attention to students and motivates them.**

This is a software, which is free of cost and easy to operate, and can help the people in many ways, Section 3 gives the approach used in solving this problem.

3. Methods / Approach Used

To build this type of software, we use Python as our back end language, The whole idea starts by creating a web app, not more that 1MB, as in rural areas, there is no Internet available, we keep in mind that this application can also run in 2G networks also, it can run on mobiles phones too.

This software involves basic logic plus complex imagination; we use a variety of libraries, to ease the process. As far as the database is concerned we use the **POSTGRES**, for its fast Input and Output (More on **Input and Output on the Implementation and Design Section**).

Using these free to use technologies, we create a very interesting project that aims to solve one problem only and that is **EDUCATION**. People can register on this application

and avail the services for free; the whole information is stored in a “brain” that contains all the things learned by the software from people.

The main aim is aid people in education with the help of machines that provides individual attention to students and clarifies their doubts.

One main problem that we are extensively focusing is searching through the brain of A.I.T and presenting the information quickly and “intelligently”, more on searching is discussed below in the **Implementation section**.

One main aspect of A.I is that it can learn new things from the surrounding that is we have added features where, People can access all the information stored on its brain and they can also teach the system.

At first the system will be in its initial stage so the system is like a baby, at first It will know nothing, but gradually it becomes smart and can help people in all aspects.

We also added text based and speech based communication, so that the user can easily and freely communicate with A.I.T, as for rural areas, we have speech in many different language thanks to Google Libraries. For instance, in India many speak Hindi in rural areas, so we have added the ability to converse with A.I.T in Hindi. In time as the system keeps getting smarter, we add different features to it, and make it better and more fun to use

Some Main Features Included:

- Easy to use, very fast and is just a 1MB website
- Speech recognition, also available in Hindi
- Starts to develop over the years, and acts as a teacher that provides assignments and monthly tests and also maintains a ‘recordbook’ for the student.
- Also has a Dedicated marketplace which is explained below
- Also incorporates features like identifying the weakness and helps to improve them

This project is in the initial phase but as we add features and make it more supportive, it can really become quite revolutionary and help lots and lots of people and make the world a better place.

We keep in mind that students need regular practice, and as a teacher this project helps by providing different quizzes generated by its own system, the student is required to submit the assignment to the system, as he/she will submit to a real human teacher. Our system checks the input received and captures all the mistakes done by the student, and aims to strengthen that areas of error just like any other teacher would do.

To make this system work in rural areas, all we need is a computer with simple 2G Internet, and we can start this system. At the current moment this system is at the initial phase, that is why it has no advanced features like emotions or humor, but according to our testers (SECTION 4), we

received a good feedback about the way the system handles their education tasks.

This project also combines the uniqueness of a new feature known as the “**The Marketplace**”, it is a virtual marketplace where different packets of knowledge are stored. (like packets of data stored on a particular subject in a **broken state**) this feature is provided to those who don't want to teach the system, they can download specific files and get everything running, Marketplace provides a great way for human teachers to upload their knowledge and in return they can get incentive as they can set the knowledge as free/paid, for example if a person knows a lot of cooking food, he can upload his knowledge on the marketplace and get money.

This would be very useful as some other person who wants to learn cooking may use the uploaded knowledge.

In short, as people could buy music from iTunes, they can buy/download knowledge from the marketplace and A.I.T could process it easily and help them.

As a matter of fact, this can be a very good **REVENUE MODEL** for investors.

A diagram to show how A.I.T can help people



4. Design

The design of the project involves creating of a lightweight web application, to achieve this we use **Django Web Framework** because of its ease.

For a user to use the whole application, first has to register on the site using their phone number, we have made the registration/login process very simple, we just need to focus on the logic of the application.

After registering/login the user is provided with a series of steps so that the **A.I.T can learn the user**, the brain of A.I.T is stored in a database that is regularly checked automatically by special kinds of “**bots**” that are also created using **Python**, they are coded with specific parameter to check every time they are released, these bots are called “**A.I.T checker bots**”.

After that, asking the user to feed some data into A.I.T so that it starts to automatically produce assignments paper, if the marketplace has some information related to the topic, then the process is faster and A.I.T adapts to the condition better.

As the user starts to interact more and more, A.I.T starts to behave like an actual teacher, it starts to ask question in between, it starts to conduct surprise tests, and starts to maintain a “recordbook of the user” that includes all the activities performed by the user. Imagine **SIRI**, **CORTONA**, **GOOGLE NOW** optimized for Educating people that is **A.I.T**.

The design of the application is straightforward and thanks to Google Translate, the whole page can also be translated into Hindi.

A.I.T is like an Operating System, but more humanly and it is on the web and can be easily accessed by all.

Some wireframes are provided for reference:



Figure 2: Depicting the look and feel of application

Images shown here are wireframes of the project and more or less depict the actual project.

5. Implementation

To implement this type of project managing data is crucial, so we start by talking about the data structures. We first define the database; the main database that we are concerned with is the **Brain Model** and the **Feed Up Knowledge** mechanism.

The implementation is as follows:-

```
classBrain:
    subject = models.CharField()
    knowledge = models.CharField()
```

knowledge is a special type of string that contains separated keywords extracted from user’s conversation, for example if a user enters, “blue is the warmest color”, then the system extracts ‘blue’, ‘warmest’, ‘color’ and gets information on the extracted keywords.

This helps the system as much content it can from user’s input.

```
classFeedQuestion:
    question = models.CharField()
    answer = models.CharField()
```

FeedQuestion is straightforward, and it depicts how the question/answer process is carried out between A.I.T and the user.

‘question’ is the question supplied by the user and ‘answer’ is the answer of the question supplied by the user.

One good thing about this is that this model maybe already created by people and maybe available on the **marketplace**.

This is main part of the project that we will be talking about in the next few paragraphs.

For **searching** we apply this approach, Given a list of data extracted from Brain, we convert the entity into set of a sorted list and apply this approach

```
frombisectimport bisect_left
defsearch(lst, item):
    return (item <= lst[-1]) and
    (lst[bisect_left(lst, item)] ==
    item)
```

For processing and to make the searching relatively faster we use the module: **MemCache** module.

The basic idea is that the system learns something, the A.I lies in processing the input and delivering it in a smart way to the students.

We also require certain machine learning abilities that is why we took of help of the module known as **PyBrain**.

As we said that A.I.T also helps to identify the weakness of students, this is achieved by creating another database only for a specific user that contains the record (recordbook), it analyses the data and generates assignments and tests based on that.

Overall the implementation is made the simplest but **complex to process**, but **the real problem** (on which we are constantly working on) will arrive when A.I.T has loads of data and takes time to process.

6. Results (Beta Testing Results)

We tested the prototype version of this application and got amazing responses, we tested it in schools and colleges and students are showing interest in this type of project. This is not a tool, but a system that achieves an AIM, that is “To Educate people and create a better world”, we believe that machines should educate people as this would be very beneficial and rewarding if executed correctly.

8/10 students found this approach good, as this provided them with regular practice and our system helped them to identify their weak points and provided a way so that they could improve it, our marketplace feature also gained many interests as it was new and it was unprecedented.

Some complained about the way it spoke, but in time, everything would become a lot smoother as A.I.T continues to learn new things every day.

After some interaction with A.I.T, the system starts to behave as an actual teacher; it starts to identify the weakness of students and gives them suggestions on how to make it better.

7. Conclusion and Future Direction

We believe that if we are able to implement this project at a large scale, then we can solve a major in our country, why we waste human life in educating people while an ARTIFICIAL INTELLIGENCE TEACHER can help us.

We are explorers of this infinite universe, and to reach the limits we have to take help of these smart machines, that allow us to reach the utmost potential of human life and achieve great things that allows us to explore the secrets of the universe and unlock many paths to different worlds and last but not the least, continue to expand and explore human race.

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