Interactive AI Educational Chatbot (Edu-ai)

TechShield Support

* Tony Rathelele
* Enough Mlimo
* Andani Mapholi
* Ngcebo Ngcobo
* Masego Mogale

Contents

[Introduction 2](#_Toc198540458)

[Tools and Technologies 2](#_Toc198540459)

[Chatbot Design: 2](#_Toc198540460)

[Conversation Flow 3](#_Toc198540461)

[Feature Implementation 4](#_Toc198540462)

[Sample Interaction 5](#_Toc198540463)

[Deployment 5](#_Toc198540464)

# Introduction

1.1 Purpose

A no-code chatbot called the AI Knowledge Assistant was created as a teaching tool to explain the foundations of artificial intelligence (AI). Users can explore important AI ideas, pose follow-up questions, view multimedia explanations, and get tailored learning recommendations in an interactive learning simulation.

1.2 Goals

* Assist users in comprehending fundamental AI ideas including machine learning, natural language processing, LLMs, and neural networks.
* Describe the differences between machine learning, deep learning, and artificial intelligence.
* Display practical uses of AI in various businesses.
* Bring up ethical issues when developing AI.
* Offer access to other learning resources and multimedia assistance

# Tools and Technologies

|  |  |
| --- | --- |
| Tools and Technologies | Purpose |
| Landbot.io | Main platform for developing the logic tree and creating the no-code chatbot. |
| OpenAI ChatGPT AP | For more complex NLP processing and open-text communication. |
| CAPACITI Course Material | Cited and utilized as the training source for precise AI information. |

# Chatbot Design:

3.1 Overview

Landbot.io was used to build the chatbot, which allowed for a visual flow-based design and the incorporation of visual aids, suggested learning modules, follow-up responses, and static Q&A content. Both open-text and button-based interactions are supported by the chatbot.

Topics Covered:

The chatbot includes 15+ Q&A pairs organized into the following themes

1. Core Terminologies:

* What is the definition of machine learning?
* What is the meaning of natural language processing?
* Explain the meaning of large language models.
* What are neural networks?
* How can you explain computer vision?

1. AI vs ML vs Deep Learning:

* Can you please distinguish AI, ML, and Deep Learning

1. Real-World Applications:

* How does AI effect education?
* Does AI have a huge impact on the transportation industry.
* How can AI help analyze medical images?
* How is AI used by banks and other financial institutions to detect fraudulent?

1. Basic Ethical considerations:

* What are the challenges in interpreting AI driven decisions
* What are the implications of AI on Data privacy and Security?
* Who is accountable for AI-Driven decisions and outcomes?
* What method can be used to ensure AI models are fair and unbiased?
* What are the potential social implications of AI adoption?

# Conversation Flow

4.1 **Flow Structure:**

* User selects a term from a button list.
* Bot gives a concise definition + simple visual.
* Offers follow-up questions:
  + “What are the types of machine learning?”
  + “How is ML used in daily life?”
  + “What tools are used in ML?”

**Further Learning:**

“Explore our ‘AI Fundamentals Glossary’ module [linked].”

**4.2 AI vs ML vs Deep Learning**

**Objective:** Clarify distinctions between AI, Machine Learning, and Deep Learning.

**Flow Structure:**

* Starts with a visual comparison chart or analogy.
* User selects one of the three terms to learn more.
* Bot explains:
  + AI: defines the term
  + ML: a subset of AI
  + Deep Learning: a subset of ML using neural networks

**4.3. Real-World Applications Across Industries**

**Objective:** Show how AI is used in different sectors.

**Flow Structure:**

* User selects an industry:
  + Healthcare
  + Finance
  + Transport
  + Education
* Bot describes:
  + A common AI use case in the above-mentioned industry
  + Benefits and basic functioning

**4.4. Basic Ethical Considerations in AI**

**Objective:** Introduce fundamental AI ethics concepts.

**Topics Covered:**

* Bias and fairness
* Data privacy and security
* Challenges in AI
* Accountability
* Social implications of AI

**Flow Structure:**

* User chooses a topic → Bot explains with example.

# Feature Implementation

|  |  |  |
| --- | --- | --- |
| | **Feature** | | --- | | **Description** |
| |  |  | | --- | --- | | **Interactive** |  | | Users can use a button or free text input to explore predefined AI questions and topics. |
| Multimedia Support | Subjects like neural networks and natural language processing pipelines are illustrated via image. |
| Sustained Assistance | Sustained Assistance each topic allows users to pose up to three follow-up questions, with responses that take context into account. |
| Additional Learning | Additional Learning Suggestions CAPACITI learning modules and slide decks are suggested at the end of each topic. |
| Linking Concepts | Linking Concepts together NLP and neural networks are mentioned in LLM, for example, demonstrating how topics are connected. |
| Citations Responses | Citations Responses reference outside reading where needed and the material of the CAPACITI bootcamp. |
| Feedback System | Feedback System to recommend changes, users can input "feedback" or rate responses. |

# 

# Sample Interaction

User: What is definition of ML  
Bot: -Machine learning is a branch of artificial intelligence that enables algorithms to uncover hidden patterns within datasets. It allows them to predict new, similar data without explicit programming for each task.

Would you like to learn how it works or where it's used?

User: What are the types of machine learning?   
Bot:

* Supervised Learning: Learns from labelled data and makes predictions
* Unsupervised Learning: Finds patterns in unlabelled data
* Reinforcement Learning: Learns through trial and error with rewards.

User: Yes  
Bot: NLP is used in sentiment analysis to identify texts' feelings and viewpoints, frequently utilizes it to comprehend client feedback.

**Error Handling**

Use Condition Block after an Input Block:

If the input is invalid, an error response message will be “not found”.

# Deployment

**Access Link**

The chatbot is hosted via GitHub and can be accessed publicly at:

Citations & Resources

Images

* <https://cdn.analyticsvidhya.com/wp-content/uploads/2021/08/66565What-is-an-Artificial-Neural-Networks.jpeg>
* <https://th.bing.com/th/id/OIP.br1HtmR2BWcPdtrvcISP4gHaD3?cb=iwc2&rs=1&pid=ImgDetMain>
* <https://th.bing.com/th/id/OIP.HtS2xYJlGxRI7oNRdaoUDAHaD4?cb=iwc2&rs=1&pid=ImgDetMain>
* <https://as1.ftcdn.net/v2/jpg/05/95/60/02/1000_F_595600270_WEMQvjrGXDopoKjHwc3ZVlY6S0Hvq1hf.jpg>
* <https://th.bing.com/th/id/OIP.rea85-vxkz7Vu1TsaQrvNgHaFA?cb=iwc2&rs=1&pid=ImgDetMain>
* <https://th.bing.com/th/id/OIP.zlQIouLdD_kOmGkzBGGlKwHaEK?cb=iwc2&rs=1&pid=ImgDetMain>

Learning Resources:

ML: <https://www.ibm.com/think/topics/machine-learning>

LLM: <https://www.ibm.com/think/topics/large-language-models>

Neural Network: <https://www.ibm.com/think/topics/neural-networks>

Computer Vision: <https://www.ibm.com/think/topics/computer-vision>

NLP: <https://www.ibm.com/think/topics/natural-language-processing>

Course Link:

<https://www.coursera.org/courses?query=nlp>