Global Affairs Explainer AI

Project Report

4ème année ingénierie informatique

Cybersécurité

Groupe : TP B

Élaboré par :

NEJJAR Nizar

BENNANI Yassine

ZERDA Mouad

Année universitaire : 2025/2026

1. Introduction

Accessing clear and reliable explanations of global affairs and international conflicts can be challenging due to the complexity of geopolitical topics and the abundance of fragmented information online. Many systems rely on real-time news sources, which can be unstable, incomplete, or difficult to verify.

This project presents Global Affairs Explainer AI, an AI-powered web application that allows users to ask questions about global conflicts, international organizations, and geopolitical issues. The system uses Retrieval-Augmented Generation (RAG) to provide accurate, grounded, and consistent explanations.

2. Project Objectives

The main objectives of the project are:

- To build an AI-powered web application for explaining global affairs topics
- To use Retrieval-Augmented Generation to improve answer accuracy
- To avoid reliance on unstable real-time data sources
- To generate clear, neutral, and factual explanations
- To design a simple and deployable full-stack system

3. System Architecture

The application follows a client–server architecture:

1. **Frontend (React)**
   - Accepts user questions
   - Displays AI-generated explanations
2. **Backend (FastAPI)**
   - Handles requests
   - Performs document retrieval
   - Generates responses using an LLM
3. **Knowledge Base**
   - Curated text documents on global affairs
   - Used as the retrieval source for RAG

4. Technologies Used

Frontend

- React.js
- HTML / CSS
- JavaScript (Fetch API)

Backend

- Python

- FastAPI
- Uvicorn

AI & NLP

- Hugging Face Transformers
- Flan-T5 language model
- TF-IDF vectorization
- Cosine similarity

5. Retrieval-Augmented Generation (RAG)

Retrieval-Augmented Generation combines information retrieval with language generation.

In this project:

- The system first retrieves relevant documents from a local knowledge base
- TF-IDF is used to measure similarity between the question and documents
- The most relevant documents are selected as context
- The language model generates an answer using only this context

This approach significantly reduces hallucinations and improves factual accuracy.

6. Knowledge Base

The knowledge base consists of curated textual documents covering:

- Major global conflicts (Ukraine, Gaza, Sudan, Syria, Yemen)
- International organizations (NATO, United Nations)
- Global diplomacy and humanitarian crises

7. Answer Generation

A Large Language Model (Flan-T5) is used to generate responses.

Prompt engineering is applied to ensure:

- Neutral and factual tone
- No repetition of the question
- No speculation or opinions
- Detailed explanations

The model is instructed to rely only on retrieved context.

8. User Interface

The user interface is designed to be:

- Simple and intuitive
- Centered and readable
- Focused on clarity

Users can:

1. Enter a question
2. Submit it
3. Receive a detailed explanation

9. Limitations

- The system relies on the completeness of the knowledge base
- It does not provide real-time updates
- It does not generate opinions or predictions
- The scope is limited to global affairs topics

10. Future Improvements

Potential enhancements include:

- Expanding the knowledge base
- Chunking documents for more precise retrieval
- Displaying retrieved sources
- Supporting document uploads (PDF, text)
- Deploying the application to a cloud platform

11. Conclusion

Global Affairs Explainer AI demonstrates how Retrieval-Augmented Generation can be used to build a reliable and explainable AI system. By combining document retrieval with a language model, the application produces accurate, consistent, and meaningful explanations of complex global topics. The project successfully applies AI concepts to a real-world educational use case.