



# AI PILOT ASSISTANT

Revolutionizing Aviation with Real-Time AI  
Support

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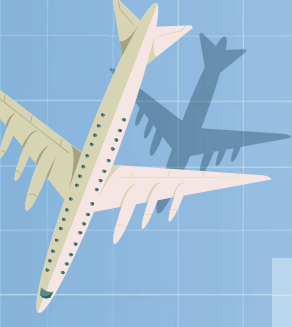
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# INTRODUCTION

"Hello everyone, I'm **Aniq Ramzan**, student of the **AI Bootcamp Cohort 3 at atomcampx NUST**. During the program, I developed an **AI Pilot Assistant**—a tool that provides pilots with real-time aviation data like weather forecasts, flight status, and emergency procedures. Today,

I'll share how this project solves critical challenges in aviation and the impact it can have on the industry. Let's dive in!"



# KEY FEATURES

1. **Emergency Procedures:** Retrieve detailed procedures for various scenarios.
2. **Real-Time METAR Data:** Fetch up-to-date METAR reports for any airport.
3. **Live Flight Data:** Display real-time flight information (altitude, speed, heading).
4. **Weather Forecasts:** Provide detailed weather forecasts for any location.
5. **Flight Status:** Check real-time flight status and delays.

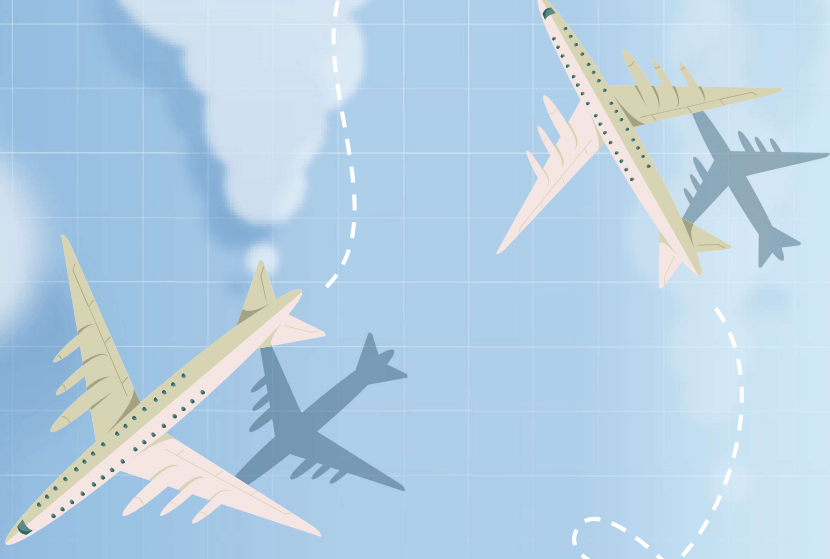
# TECHNICAL APPROACH

## Methodology:

- Iterative development process: Requirement Analysis → Tool Selection → Prototype Development → Testing → Deployment.

## Tools and Frameworks:

- **LangChain:** For building the conversational agent.
- **Groq:** For fast and efficient LLM inference.
- **Streamlit:** For the user interface.
- **APIs:** CheckWX, OpenSky Network, Open-Meteo, AviationStack.
- **Vector Database:** InMemory for emergency procedures.



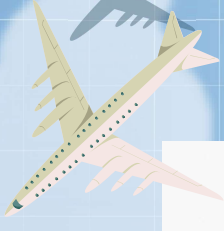
# CHALLENGES & SOLUTIONS

## Challenge 1: Real-Time Data Integration

- **Solution:** Used asynchronous requests and caching.

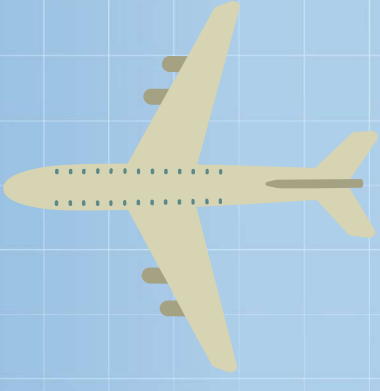
## Challenge 2: Handling API Errors

- **Solution:** Added error handling and fallback responses.



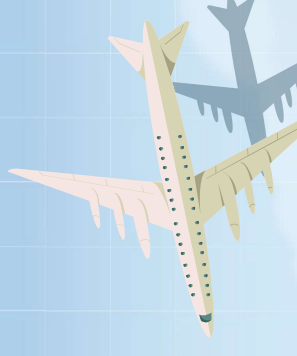
# DEVELOPMENT PROCESS

- **Set Up Environment:** Installed libraries and configured API keys.
- **Build Core Features:**
  - Emergency Procedures: Loaded PDF into FAISS.
  - METAR Data: Integrated CheckWX API.
  - Flight Data: Used OpenSky Network API.
  - Weather Forecasts: Integrated Open-Meteo API.
  - Flight Status: Used AviationStack API.
- **Create Chatbot:** Used LangChain and Groq for conversational agent.
- **Build UI:** Created a Streamlit app with an aviation-themed design.
- **Test and Deploy:** Tested locally and deployed on Hugging Face Spaces.



# FUTURE IMPROVEMENTS

- **Aircraft Performance Analytics:** Analyze fuel efficiency, climb rate, etc.
- **Real-Time Best Route Provider:** Suggest optimal flight routes.
- **Real-Time Plane Checking:** Provide diagnostics and health monitoring.
- **Enhanced NOTAM Integration:** Improve NOTAM data retrieval







# CONCLUSION

- The AI Pilot Assistant provides quick and accurate access to aviation-related information.
- It integrates multiple APIs and uses advanced frameworks like LangChain and Groq.

# THANKS!

DO YOU HAVE ANY QUESTIONS?

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