

Team: ML Crew

AI-Powered Interactive Learning Assistant for Classrooms

Objective: Build a Multimodal AI assistant for classrooms to dynamically answer queries using text, voice, and visuals while improving student engagement with personalized responses.

1. Introduction

Modern classrooms require interactive tools that can keep students engaged and support individual learning needs. EduVision AI is a real-time AI-powered interactive assistant designed to address this by combining text, voice, visual inputs, and emotion recognition to enhance classroom participation and understanding.

EduVision aligns with Intel's AI strategy by using OpenVINO for optimized model inference, ensuring low-latency responses on Intel hardware. It supports accessibility, engagement, and inclusive learning.

2. System Design

Architecture Overview:

EduVision AI integrates text, voice, image, and PDF inputs via a Streamlit interface, processes them through optimized NLP and vision pipelines, and delivers personalized output using OpenVINO.

Key Components:

- Voice input with SpeechRecognition
- PDF processing using pdfplumber
- Emotion detection via DeepFace (image-based)
- DistilBERT QA model optimized with OpenVINO
- Multilingual translation using deep-translator
- Summarization and study tips generation via NLP

3. Implementation

Technologies Used:

- Backend/Inference: OpenVINO, HuggingFace, ONNX

- NLP: Transformers, DistilBERT, deep-translator
- Visuals: DeepFace, PIL, OpenCV
- UI: Streamlit
- Voice: SpeechRecognition
- PDF: pdfplumber
- Deployment: Streamlit Cloud, Ngrok

Intel Optimization:

- Converted DistilBERT to OpenVINO IR using optimum.intel
- Used OVModelForQuestionAnswering for low-latency inference on Intel CPU- Enables fast, efficient deployment on AI PC with Intel hardware

4. Conclusions

EduVision AI proves that a multimodal classroom assistant can:

- Answer diverse student questions in real time
- Monitor student engagement via emotion detection
- Support inclusive learning with multilingual and multimodal input

It aligns with Intel's goals for real-time, edge-deployable AI. OpenVINO boosts its performance on Intel CPUs, making it practical for everyday use in classrooms. Future enhancements include video-based emotion monitoring, quiz generation, and teacher dashboards.

5. References

1. OpenVINO Toolkit: <https://www.openvino.ai>
2. EduVision GitHub: <https://github.com/bhoomika1705126/EDUVISION-AI>
3. HuggingFace Transformers: <https://huggingface.co>
4. DeepFace: <https://github.com/serengil/deepface>
5. PDFPlumber: <https://github.com/jsvine/pdfplumber>
6. Intel DevCloud: <https://www.intel.com/content/www/us/en/developer/tools/devcloud/overview.html>