**Edu Split: Exam Paper Sections Detection**

**Project Overview**

**Edu Split is a system designed to automatically detect and extract different sections of exam papers, such as questions, tables, and diagrams. The goal is to split exam paper images into sections for easier analysis, grading, or archival.**

**The project uses a custom YOLOv8 model trained on a public dataset created specifically for this task, OpenCV for cropping, and Google Gemini API to extract text from the cropped sections.**

**Dataset**

**The dataset used for this project contains annotated images of exam papers with labeled sections. It was created and annotated using Roboflow.**

* **Dataset Name: Exam Paper Sections Detection**
* **Workspace: traintest-pveiz**
* **Version: 1**
* **Access: Public**

**Dataset URL:**[**https://app.roboflow.com/traintest-pveiz/exam-paper-sections-detection-5vhzy/1**](https://app.roboflow.com/traintest-pveiz/exam-paper-sections-detection-5vhzy/1)

**Available Formats: YOLOv8, COCO, VOC, and others.**

**Model Training**

**YOLOv8 Finetuning**

1. **Custom Annotations: The dataset was annotated using Roboflow with labels corresponding to different sections of exam papers.**
2. **Model: YOLOv8 (ultralytics)**
3. **Training Setup:**
   * **Input: Images from the dataset**
   * **Output: Bounding boxes for each section**
   * **Hyperparameters: Default YOLOv8 training parameters, fine-tuned on the custom dataset.**

**COLAB LINK:** [**https://colab.research.google.com/drive/1\_RwIpunAtfo95imKD9PpO6KXe\_oY1c\_Y**](https://colab.research.google.com/drive/1_RwIpunAtfo95imKD9PpO6KXe_oY1c_Y)

**Detection, Cropping & Text Extraction Workflow**

**Once the model is trained, the workflow proceeds as follows:**

1. **Input an Exam Paper Image**
2. **YOLOv8 Detection: Predicts bounding boxes for all sections.**
3. **OpenCV Cropping: Crops each detected section based on the bounding box coordinates.**
4. **Gemini Text Extraction: Each cropped section is sent to the Google Gemini API to extract text from the images.**

**Project Features**

* **Automatic Section Detection: Detects multiple sections like questions, tables, diagrams, etc.**
* **Accurate Cropping: YOLOv8 ensures precise bounding boxes for each section.**
* **Text Extraction: Gemini AI extracts text from each cropped section for further analysis or grading.**
* **Public Dataset: Dataset is available publicly for replication or research.**

**Future Improvements:**

* **Make a custom finetuned handwriting detection model to replace it with gemini**

**References**

* **Roboflow Dataset:** [Exam Paper Sections Detection](https://app.roboflow.com/traintest-pveiz/exam-paper-sections-detection-5vhzy/1)
* **YOLOv8 Documentation:** Ultralytics YOLOv8
* **OpenCV Documentation:** OpenCV
* **Gemini API:** Google Gemini