**Elephant Human Conflict**

**Abstract**

Human lives and cultivated lands are increasingly endangered due to elephant interference. To avoid life-threatening incidents, protect cultivated lands, and ensure elephant conservation, it is crucial to monitor and prevent elephant movements. This project aims to develop a system that detects elephant movements and alerts relevant authorities to take preventive measures.

**Components**

* **Raspberry Pi**: The micro processing unit.
* **Ultrasonic Sensor**: Detects motion within a specified range.
* **Jumper Wires**
* **USB Camera**
* **GPU Enabled Machine**: Processes images for detection and classification.

**Implemented Library**

* Raspberry pi:

1. mysql-connector-python
2. opencv-python

* Windows machine:

1. mysql-connector-python
2. opencv-python
3. ultralytics

**Methodology**

1. **Sensor and Camera Setup**:
   * An ultrasonic sensor is attached to a Raspberry Pi.
   * The sensor is connected to the Raspberry Pi using the GPIO pins:
     + Trig pin: GPIO 23
     + Echo pin: GPIO 24
     + Ground (GND)
     + VCC: 5V
   * A USB camera is also connected to the Raspberry Pi.

* **Stapes on Raspberry Pi**

**3 . Motion Detection**:

* + The ultrasonic sensor senses motion within a 200 cm range.
  + When motion is detected, the sensor triggers the camera to capture an image.

1. **Image Storage**:
   * The captured image is uploaded to a local database(test\_db1.images1).

* **Stapes on Windows**

1. **Image Processing**:
   * The recent captured images are downloaded to a local file (all\_images) on a Windows machine from the database.
   * An AI/ML model analyzes the images to detect and classify objects.
   * If a suspected object (in our case: human or elephant) is detected, the image is forwarded to the backend team.
   * Images that do not match the criteria (i.e., detected object is neither human nor elephant) are automatically ignored (non\_detected).
2. **Detected Images Folder**:
   * After detection and classification, moved to another folder (detected).
   * The folder (detected) contains the detected images and serves as a common database accessible by both the Java development team and the AI/ML team.
   * The folder (detected) is hosted on a local server with the IP address.

**Java Developer Workflow**:

* + The Java development team accesses the shared folder to start their work.