**FUTURE WORK**

(Based on expo feedback**)**

**Title: ECO-SENSE(AI)NATOR**

**Based on Arduino (enclosed spaces)**

***Presented in***

***“Project expo and poster presentation on***

***UNLEASHING THE IMPACT OF SDG IN REAL WORLD APPLICATION OF ENERGY AND AI”***

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**Avishek Rauniyar**

**CH. Nikhilesh Krishna**

**N. Kireeti Sai Bharadwaj**

**Sujay Bharath Raj**

**Class: S2 B. Tech CSE-AIE-A**

The future work (scope) of the Arduino-based ECO-SENSE(AI)NATOR is mainly based upon model training, improvised speed of the model, data transmission to web and addition of more sensors. Some of the future scopes of the project are defined here as follows:

* **Improved Model Training:**

Further research could focus on refining the YOLO V5 model's training process to enhance its accuracy in wild animal detection. This could involve exploring larger and more diverse datasets, fine-tuning model parameters, and investigating techniques to handle varying environmental conditions.

* **Localization and Tracking:**

Investigate methods to not only detect but also track the movement of detected animals. This would require incorporating tracking algorithms that can predict the trajectory of animals, providing valuable insights into their behaviour patterns and potential interactions with humans.

* **Integration of more sensors:**

Add some more sensors to collect various data and get more detailed information about the forest. The sensors could be like sound sensor for audio-based monitoring, alarms for warning, motion sensor for detecting motion of animals in forests, etc.

* **Edge Computing:**

Explore the feasibility of implementing the detection and alert system using edge computing. This approach could reduce latency and enhance the system's responsiveness by processing data locally, which is particularly important in critical situations.

* **Multispecies Recognition:**

Extend the system's capabilities to recognize and differentiate between various species of wild animals. This would require expanding the dataset and fine-tuning the model to accurately classify a diverse range of animals, contributing to more comprehensive wildlife conservation efforts.

* **User-Generated Data:**

Integrate the system with user-generated data, such as sightings reported by local communities or tourists. This could create a crowdsourced approach to wildlife detection and validation, enhancing the system's coverage and accuracy.

* **Alert Customization:**

Allow users to customize the alert system based on their specific preferences and needs. For example, users might want to receive different levels of alerts depending on the type of animal detected or the proximity to certain areas.

* **Environmental Adaptability:**

Research how the system can adapt to different natural environments and ecosystems. Factors such as vegetation, terrain, and lighting conditions can impact the effectiveness of the detection model.

* **Collaboration with Conservation Organizations:**

Collaborate with wildlife conservation organizations and governmental bodies to implement the system in areas with high human-wildlife interactions. This could involve integrating the system into existing wildlife conservation efforts and policies.

* **Ethical and Privacy Considerations:**

As with any technology involving real-time monitoring, address the ethical implications and privacy concerns related to wildlife and human interactions. Develop protocols for data collection, sharing, and user consent that respect both animal welfare and human privacy.