TEAM OPENCV - CAPSTONE PROJECT

ANIMAL SPECIES DETECTION USING DEEP LEARNING

TITLE: Proposal for Improving Animal Species Detection Using Deep Learning

INTRODUCTION

The purpose of this proposal is to outline the improvements that can be made to the existing project on Animal Species Detection Using Deep Learning. The project aims to develop a deep learning model that can accurately identify endangered species such as buffalos, rhinos, elephants, zebras and many more. By automating the identification process, the model can aid in monitoring and protecting these species in their natural habitats.

BACKGROUND

The previous work on animal species detection using deep learning techniques focused on developing a model that can accurately classify endangered animal species, such as buffalos, elephants, rhinos, and zebras, in their natural habitats to protect them from further extinction and reduce poaching by humans. The deep learning model can process large amounts of data quickly and accurately while automating the process, leaving ample time for developing more effective conservation strategies.

PROBLEM STATEMENT

The current project exhibits potential, but significant improvements are required in data annotation, object recognition, image classification, other techniques, and model deployment to elevate the performance of animal species detection using deep learning.

METHODOLOGY

1. **Addressing Data Annotation:**
   To avoid manual annotation of over 6000 images, we will either use one of the following.
   - Search for pre-labelled dataset.
   - Use AI tools for automated labelling.
   - Utilize unsupervised learning for labeling the images.

2. **Object Recognition & Image Classification Module:**
   - Select a suitable object recognition algorithm, such as Single Shot Multibox Detector (SSD) or You Only Look Once (YOLO).
   - Choose an appropriate image classification model, such as Convolutional Neural Networks (CNNs) or Residual Networks (ResNets).
   - This combination of methods can provide a comprehensive analysis of the animal species in the dataset.

3. **Other Techniques**
   - Evaluate model performance using accuracy, precision, recall, and F1-score metrics.

- Fine-tune the model by adjusting architecture and hyperparameters for improved accuracy and robustness.
- Apply regularization techniques to prevent overfitting and enhance generalization capabilities.

4. **Model Deployment and User Interface**
   - Create a user-friendly interface to allow users to interact with the model, upload images, and receive real-time predictions.
   - The model will be deployed on a cloud platform to ensure scalability and accessibility.

RESULTS:

The proposed improvements target better accuracy and generalization for the animal species detection model. By focusing on data annotation, object recognition algorithms, additional techniques, and model deployment, we aim to achieve higher accuracy on both training and test datasets. Evaluation will be based on metrics like accuracy, precision, recall, and F1-score.

CONCLUSION:

Improving the animal species detection model using deep learning techniques is crucial for effective conservation efforts. By implementing the proposed improvements, we aim to develop a more robust and accurate model that can accurately identify endangered species in real-life scenarios. The enhanced model will contribute to the protection and preservation of these species by automating the identification process and aiding in monitoring efforts.

REFERENCES:

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