Deep Learning Model for Surveillance (Drone-based) Applications

Overview

This repository contains resources for a deep learning model developed for semantic segmentation tasks in surveillance scenarios using drone-based imagery. The model aims to accurately classify and segment various classes such as vegetation, paved areas, obstacles, and people in outdoor scenes captured by drones.

Files Included

- model_training.ipynb: Jupyter notebook containing the code for training the deep learning model on drone-based imagery. This notebook includes sections for data preprocessing, model architecture, training process, evaluation metrics, and deployment considerations.
- report.pdf: Report file providing detailed information about the project, including its objectives, methodology, results, and conclusions.
- README.pdf: This file, providing an overview of the repository and instructions for running the code.
- project_video.mp4: Video file explaining the project and its components, providing a visual walkthrough of the process and results.

Instructions for Running the Code

Option 1: View on Kaggle

1. Create a Kaggle account if it does not exist already.
2. Once logged in, go to the Kaggle homepage and click on the "Datasets" tab.
3. Click on the "New Dataset" button and follow the instructions to create a new dataset.
4. Upload the provided zip file containing the .ipynb notebook, report file, README file, and project video to create a new dataset.
5. After the dataset is uploaded, click on the notebook file (model_training.ipynb) to open it in the Kaggle notebook environment.
6. Execute each code cell sequentially by clicking on the "Run" button, following the instructions provided in the notebook.
7. Monitor the training process and evaluate the model's performance using the provided metrics.
8. Save the trained model and explore deployment options as needed.

Option 2: Local Environment

1. Ensure that you have Python installed on your system.
2. Clone this repository to your local machine or extract the downloaded zip file.
3. Navigate to the project directory in your terminal or command prompt.
4. Install all the requirements.

5. Open and run the model_training.ipynb notebook in your preferred Python environment (e.g., Jupyter Notebook).
6. Execute each code cell sequentially, following the instructions provided in the notebook.
7. Monitor the training process and evaluate the model's performance using the provided metrics.
8. Save the trained model and explore deployment options as needed.

Option 3: View the Project Video

- Open the project_video.mp4 file in any video player to watch an explanation of the project and its components.