Final Project Work 4Geeks Academy 2022

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Computer Vision Classification and Segmentation Models for Satellite Imagery Detection and Ukraine War Images Analysis

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Part 1

Nowadays, Segmentation of Images is the future of of Image Processing with AI, and it is leading to a Computer Vision 2.0. In particular, the proliferation of satellite imagery has led to an improved understanding of the planet. With segmentation, we are able to better achieve everything from mobilizing resources during disasters to monitoring effects of global warming. We are able also to make a **Change Detection**: we can compare two satellite images, that is performing segmentation in different times, and understand if there have been any changes.
In this Final Project Work, train a Segmentation Model (i.e. Unet, DeepLab) on some segmented Satellite Imagery Training sets such as one or more of these:
https://www.kaggle.com/competitions/dstl-satellite-imagery-feature-detection/data
https://s2glc.cbk.waw.pl/extension
The difference is the resolution. For change detection analysis are useful both. Download some Ukraine Images from 2018 and 2022, create the maps of some areas samples (i.e. Kiev or Mariupol) and analyze the difference: are there destroyed buildings? Are there destroyed roads?. For further understanding read this:
https://deepsense.ai/deep-learning-for-satellite-imagery-via-image-segmentation/

Make **EDA** (Exploatory Data Analysis) and plot output panels plotting: training curves, classification barplots, misclassifications, cluster analysis and all the due analysis.

Part 2

Find Satellite Imagery from Ukraine and try to segment them and detect abandoned military vehicles or death people bodies or some suspicious activities. You can use one or more of the following datasets:

https://www.groundstation.space/satellite-imagery-companies-in-support-of-ukraine/
https://www.kaggle.com/datasets/mathurinache/ukraine-war-images

You must label some hundreds of images with annotation tools, unless you find already labelled images.

Make **EDA** (Exploatory Data Analysis) and plot output panels plotting: training curves, classification barplots, misclassifications, cluster analysis and all the due analysis.

The purpose of this project is to show how to use AI in Ukraine War Analysis.