

Car driving segmentation

Objective :

Segment cars and humans in a given picture.

Mission statement :

- Use the provided dataset to segment.
- Define your modelisation strategy.
- Use the framework of your choice (only one framework allowed).

Suggested Dataset :

- [Cityscapes Image Pairs](#)
- [Cityscapes Documentation](#)

Ressources:

- Potentially useful libraries:
 - [Image Segmentation Keras](#)
 - [Segmentation models](#)
 - [skyimage: segmentation](#)
 - [PixelLib](#)
- Blogs:
 - [A detailed example of how to use data generators with Keras](#)
 - [A Beginner's guide to Deep Learning based Semantic Segmentation using Keras](#)
 - [Image Segmentation using Python's scikit-image module](#)
- Notebooks:
 - [Pet 🐶 U-Net Image Segmentation](#)

- [Car Driving Segmentation | UNET from scratch](#)
- Youtube videos:
 - [Explanation of the concept of image segmentation by Shree Nayar \(Columbia University\)](#)
 - [Python Image Segmentation Tutorial \(2022\) \(without ML algorithm\)](#)
 - [Instance Segmentation using Mask-RCNN with PixelLib and Python](#)

Livrables :

- **A notebook** (html or ipynb) :
 - Introduction
 - Dataset loading
 - Data exploration
 - Preprocessing
 - Modelization
 - Performances evaluation
 - Conclusion
- **BONUS:**
 - Script: an API capable of taking an image as input and output the predicted mask.
 - Dashboard: a GUI capable of calling your API and showing the input image and the predicted mask.

Evaluation criterias (120 / 100 pts) :

Skill	Description	Points
Introduction	<ul style="list-style-type: none">• Using at least 3 different resources (kaggle notebooks, blogs, youtube videos or else...), explain your strategy and why you think this is going to work.• Bibliographical references are present.	20
Preprocessing	<ul style="list-style-type: none">• Describe the steps and usefulness of your image pre-processing.	10
Modelization	<ul style="list-style-type: none">• How does your model work and why do you think it is interesting for this dataset modelisation?	20
Performances	<ul style="list-style-type: none">• A baseline is defined.• All necessary comparisons are done.• Figures are readable and legends are present.• The number of points for this criteria is weighted by your model performances.	50
Application (bonus)	<ul style="list-style-type: none">• The script (API) and the dashboard are functional.	20