

Practical mini-project

Deep learning for object detection

Minh-Tan Pham, Matthieu Le Lain

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IUT de Vannes, Université Bretagne Sud

minh-tan.pham@univ-ubs.fr

Lab assignment

Practical mini-project R6.A.07: Deep learning for object detection

- Work in group of 4.
- 2 weeks of class/work + 1 week of presentation (oral)
- You have to choose one of the following tasks and search for public datasets that you would like to demonstrate (from Kaggle other public datasets available, **not too big** !!!!)
 - **Ship detection**
 - **Vehicle detection**
 - **Animal detection**
 - **Fish detection**
 - **Other object detection tasks**
- Use **YOLOv8** or/and **Detectron2** to perform training/test of your object detection task ! (One is minimum, two for comparison is perfect !)
- Your submission (in a zip file named *R6A07_YourGroupName.zip*) should include:
 - **A PDF presentation (max 15 slides)**
 - **A Jupyter notebook file that includes your implementation + compiled outputs**
- **Evaluation:** presentation 60% + submission (slides+notebook) 40% + bonus (participation during presentations)

YOLOv8 Ultralytics

Site web: <https://docs.ultralytics.com/>

Github: <https://github.com/ultralytics/ultralytics>

The screenshot shows the Ultralytics website interface. At the top is a dark blue navigation bar with the Ultralytics logo, the word 'Home', and a search bar. Below this is a secondary navigation bar with links to Home, Quickstart, Modes, Tasks, Models, Datasets, Guides, Integrations, Usage, YOLOv5, HUB, Reference, and Help. On the left side, there is a sidebar menu with categories: Home, Quickstart, Modes (with sub-links: Train, Val, Predict, Export, Track, Benchmark), Tasks (with sub-links: Detect, Segment, Classify, Pose, Obb), Guides, Models, and Datasets. The main content area is titled 'Where to Start' and features a staircase diagram with five steps, each with a bullet point and a corresponding button:

- **Install** ultralytics with pip and get up and running in minutes. Button: **Get Started**
- **Predict** new images and videos with YOLOv8. Button: **Predict on Images**
- **Train** a new YOLOv8 model on your own custom dataset. Button: **Train a Model**
- **Tasks** YOLOv8 tasks like segment, classify, pose and track. Button: **Explore Tasks**
- **Explore** datasets with advanced semantic and SQL search. Button: **Run Explorer**

At the bottom of the main content area is a video player for 'Episode 3 | How to Train Ultralytics YOLOv8 models on Your...'. The video thumbnail shows a man's face and the text 'Train an Ultralytics YOLOv8 model on a custom dataset'. There are 'Watch later' and 'Share' icons in the top right corner of the video player.

Detectron2

Site web: <https://ai.meta.com/tools/detectron2/>

Github: <https://github.com/facebookresearch/Detectron2>



Detectron2

Detectron2 is FAIR's next-generation platform for object detection and segmentation.

Rapid, flexible research

Detectron2 was built by Facebook AI Research (FAIR) to support rapid implementation and evaluation of novel computer vision research. It includes implementations for the following object detection algorithms:

- Mask R-CNN
- RetinaNet
- Faster R-CNN
- RPN
- Fast R-CNN
- TensorMask