Day 1 – Plan

|  |  |
| --- | --- |
| Time (rough estimate) | Topic |
| 8:30-8:45 | Motivation with example   * <http://celltrackingchallenge.net> * Logo detection * <https://arxiv.org/pdf/0705.0781.pdf>   **Learning goals:** the students understand why this problem is relevant and can cite a few examples of real applications. |
| 8:45-8:50 | Classification, Object Detection, Semantic Segmentation, and Instance Segmentation  **Learning goals:** the students can understand and distinguish between the different types of image “detection” types. |
| 8:50-9:10 | How to solve the problem? Naïve Approach with a sliding window.  With real code demo. (Jupyter notebook will be available).  **Learning goals:** the students understand the difficulties of these problems and understand the need of different approaches. |
| 9:10-9:15 | Specification of problem (class + bounding box or pixel class) and an example of metric (IoU)  **Learning goals:** the students understand the goal of the problem and its characteristics. The students understand how to compare results with labels in the problem of image localization with bounding boxes (IoU). |
| 9:15:9:25 | Overview of the most important available datasets (COCO for example)  **Learning goals:** the students know the most important datasets available to train models for image detection, localization, etc. |
| 9:25-9:35 | Classical Approaches (ex. Selective search)  **Learning goals:** the students have an intuitive understanding of 1-2 classical approaches to the problem and their limitations. |
| 9:35-9:50 | DL Networks with demos (U-Net) (up to YOLOv3 and U-Net). With real code demo. (Jupyter notebook will be available).  With real code demo. (Jupyter notebook will be available).  **Learning goals**: the students have seen 2-3 deep learning models that are used to solve the problem and have a feeling for their complexity. |
| 9:50-10:00-(maybe 10:15) | Facial Recognition Demo  With discussion of code.  **Learning goals:** the students see how easy is to implement tools that solve this problem in a few lines by using existing libraries and tools. |