DETECTING PEDESTRIANS AT ZEBRA CROSSINGS

1 Overall goal of the project

The aim of this project is to develop a useful application for the detection of pedestrians at zebra crossings, in order to be part of an autonomous vehicle. Specifically, this project will focus on automatic zebra crossing recognition in the first instance, and subsequently on classifying zebra crossing images as containing or not containing pedestrians.

Several techniques have been reported in the literature to address this challenge, including both classical Computer Vision techniques and Deep Learning approaches.

We will focus on classical Computer Vision techniques for the first part, which should allow you to integrate a wide variety of the concepts presented throughout the course, and on Deep Learning approaches for the second part, which should allow you to integrate the knowledge of transfer learning and fine tuning acquired during the course.

You are expected to apply your solution to an image benchmark. For this purpose, you will need to generate your own dataset of examples, which you can complement with the use of public datasets, if needed.



2 Proposal

You will find a project proposal template on the Virtual Campus, which you must fill in and submit before 4 December. On that day we will hold an online session, group by group, to discuss your proposal. The exact time for each group will be communicated to the group coordinator in due course.

The current document only presents the overall scope of the project. Within the context of this application, you now have to break this project down into different parts in order to tackle the overall challenge that it poses. Note that you should describe the specific tasks that you will conduct to achieve your goals together with the methodology that you intend to use. The project proposal should be regarded as an essential part of the project as it pursues two specific purposes:

1. Emulate a real working environment in which you are in charge of promoting a project to a group of stakeholders who might provide funding for it.
2. The project template should provide you a roadmap to break down your project into specific tasks and timings to ensure its fulfilment.

3 Assessment criteria

In order to assess your final project, three main aspects will be taken into account: 1) Proposal, 2) Follow-up, 3) Report, and 4) Presentation. The final grade will be calculated according to the following criteria:

1) Proposal (10%) (including the Deep Learning Onramp course certificate)

2) Follow-up (10%)

3) Report (50%)

- State of the art (10%)
- Argumentation (35%)
- Methodology and Results (35%)
- Formal aspects (15%)

4) Presentation (30%)

- Formal aspects and originality (10%)
- Methodology (40%)
- Results (35%)
- Clarity of Presentation (15%)

The Report will be assessed using the rubric used throughout the course, also taking into account the self-assessment and peer assessment rubrics. The Presentation will be assessed individually. Each of the items will receive a qualitative grade, with the following numerical correspondence:

Table 1: Qualitative grades (%)

A+	A	B	C	D	E
100	90	75	50	25	0