Universitatea Tehnică "Gheorghe Asachi" din Iași
Facultatea de Automatică și Calculatoare
Prelucrarea Imaginilor - Proiect

Raport inițial - Mașinin autonome - detecție și recunoașterea semnelor de circulație

ECHIPĂ: RMA02

Mițca Dumitru - m1
Grupa 1311A

Mihalache Mihai - m2
Grupa 1311A

1 Descrierea temei

The theme for our project is computer detection and recognition of road signs, a topic that becomes more relevant every day as the idea of autonomous cars becomes more popular and more work is put towards making them reality.

Our goal is by the end of the project is to have a program that can classify road signs in real time as if they came from a camera mounted on a vehicle.

SMART objectives:

- detect all road signs in a frame; this can be measured by manually counting the road signs in the picture and comparing that against the program output; this is strictly required for our project; this can be achieved until meeting 4
- identify a road sign in a frame; it is measurable by checking how many signs it identifies correctly in X images of signs; this is strictly required for our project; this will be achieved until meeting 6
- implement a road sign classification algorithm; it is measurable by computing the percentage of correctly classified road signs; this is strictly required; this will be achieved until the end of the project

Functional requirements:

- when given an image of a road that contains road signs, our program should correctly detect road signs
- when given an image of a road that does not contain road signs, our program should not detect road signs
- our program should not misclassify one road sign as another, i.e. a stop sign should not be classified as a "you have right of way" sign
- our program should not misclassify non-road-sign objects as road signs

The technical challenges we will face are: the need for powerful hardware, the need for our program to cope with bad weather conditions. We do not believe finding a dataset of images with road signs

to be particularly difficult, but finding one specific to Romania might be harder, however, a general European dataset would quite useful.

Our project's end product will be a program classifies, in real-time, road signs from an image/video feed or similar. This would be useful in the automotive industry as autonomous vehicles become a more popular topic by the day.

Our potential clients would be automative companies that have shown interest in developing autonomous vehicles.

2 Modalitatea de lucru propusă

We plan to mostly work in parallel, and as such have split our tasks in a manner where we can work without having to wait for each other to finish a specific task.

Identificarea și alocarea task-urilor

Task ID	Descriere task	Membru echipă
task1	Research existing state of the art models	m2
task2	Research libraries and frameworks to be used in the project	m1, m2
task3	Identify a dataset we can use	m2
task4	Preprocessing the image	m1
task5	Segmenting the image into road signs	m1
task6	Writing the intermediary documentation	m1
task7	Implementing the classification algorithm (ML/AI/DL)	m2
task8	Postprocessing the results	m1, m2
task9	Writing the final documentation	m2

Git repository: `https://github.com/VedereArtificiala/prelucrareaimaginilor-proiect-itzyabois`