BLOB-FREE

PROJECT PLAN

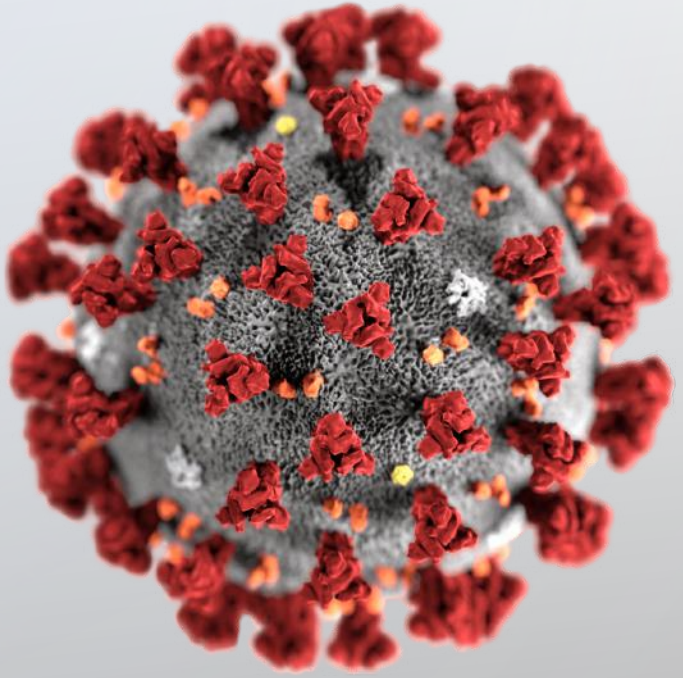
INTERDISCIPLINARY PROJECT A.Y. 2020/21

PROPOSED BY PROF. DOVIS, PROF. PIRAS AND PROF. DI PIETRA

THE PROBLEM

Coronavirus is putting at risk many lives; thus some rules must be enforced in order to prevent the spreading of the infection. Two very simple but effective measures are:

- Wearing face masks
- Avoiding “assemblages” of people

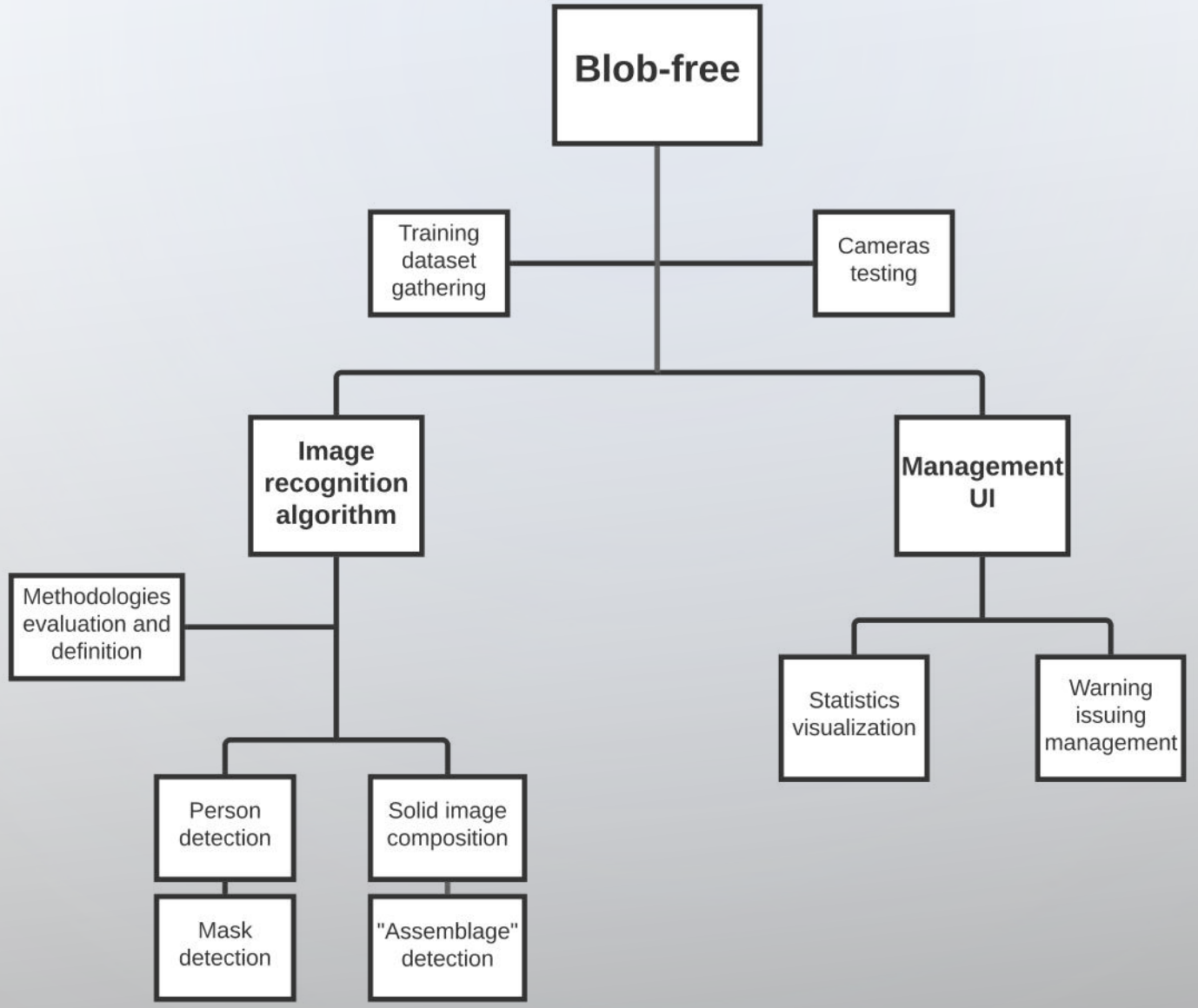


THE SOLUTION

Build a computer vision system able to detect “assemblages” of people and able to verify that everyone is wearing a mask, using a cheap digital camera and range camera connected to a Raspberry Pi.

- The system can warn users in case a dangerous situation is detected
- The management system shows statistics about the issued warnings, so that the managers of the area can take additional preventive measures
- The system can be deployed in closed spaces where “assemblages” are frequent (e.g. the corridors of a school or university)

WBS

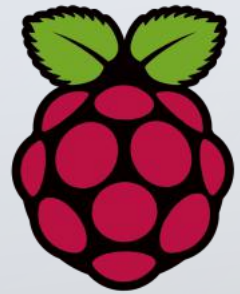

Blob-free
Training dataset gathering
Cameras testing
Image recognition algorithm
Management UI
Methodologies evaluation and definition
Person detection
Solid image composition
Mask detection
"Assemblage" detection
Statistics visualization
Warning issuing management

FIRST STEPS

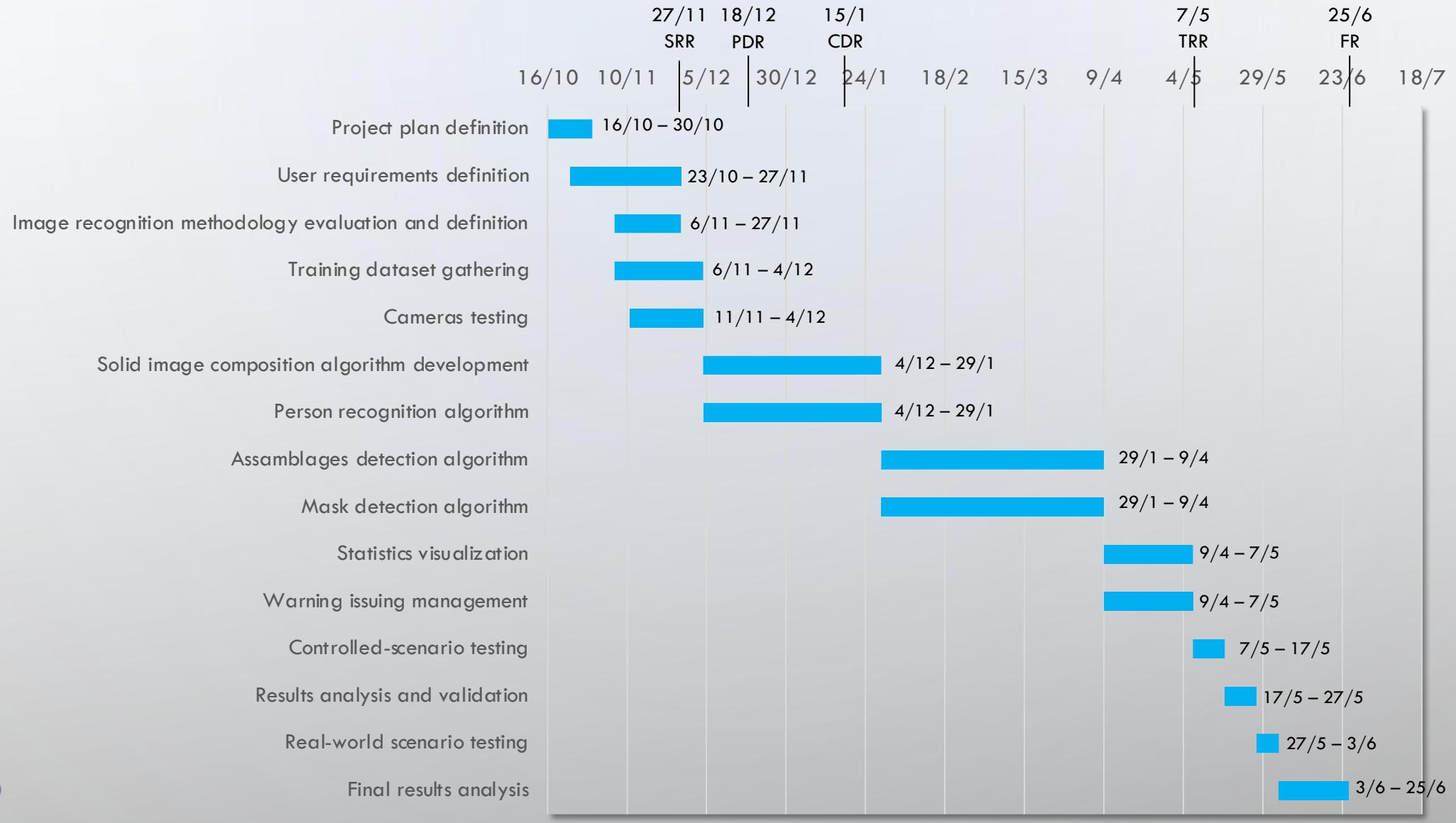
1. Gather data to use in the training of the image recognitions algorithm
2. Test cameras in different conditions and find the optimal setup
3. Evaluate the possible image recognition methodologies and choose the most suitable one for this specific task

TOOLS

- Database for the statistics
- RaspberryPi
- Digital camera
- Range camera
- OpenCV library for image recognition
- Python



WORKPLAN


27/11
SRR
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24/1
18/2
15/3
9/4
4/5
29/5
23/6
18/7
Project plan definition
16/10 – 30/10
User requirements definition
23/10 – 27/11
Image recognition methodology evaluation and definition
6/11 – 27/11
Training dataset gathering
6/11 – 4/12
Cameras testing
11/11 – 4/12
Solid image composition algorithm development
4/12 – 29/1
Person recognition algorithm
4/12 – 29/1
Assamblages detection algorithm
29/1 – 9/4
Mask detection algorithm
29/1 – 9/4
Statistics visualization
9/4 – 7/5
Warning issuing management
9/4 – 7/5
Controlled-scenario testing
7/5 – 17/5
Results analysis and validation
17/5 – 27/5
Real-world scenario testing
27/5 – 3/6
Final results analysis
3/6 – 25/6

THANK YOU FOR THE ATTENTION!

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