

FIRE
DETECTION



Forest

FireFighter F³

3rd sprint review

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Epics and User stories



Direction and
movement



Computer vision



Website and
communication

Peanuts

Tasks needing
one teammate
for 1 session to
be completed

Simple

Tasks needing
one teammate
for 1 or more
session

Medium

Task needing a
subgroup for 1
or more session

Hard

Tasks needing
a subgroup for
an entire sprint

Very Hard

Task needing a
subgroup and
several up to 2
sprints

01

PLANNED AND REALIZED STORIES



Direction and
movement

Path between
2 GPS points



-Amelie Maier
-Ruiqi Hu



Computer
vision

Fire detection
Routine



-Corentin Tatger
-Axel Jorge



Website and
communication

Displaying Fire
position on site



-Youssef Amari
-Liao Zhang

Coding procedure and standards

Coding standards



Standard 1: Naming convention:

- CamelCase* for variables
- snake_case* for functions and methods



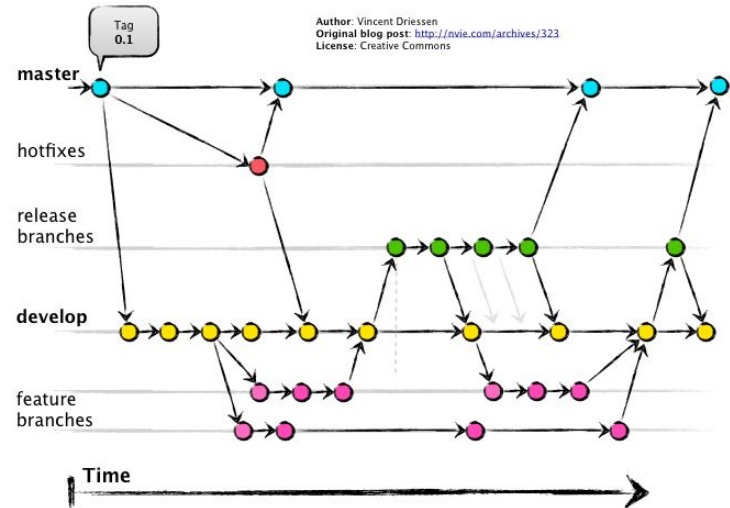
Standard 2: Length of methods:

Functions should not exceed 20 instructions

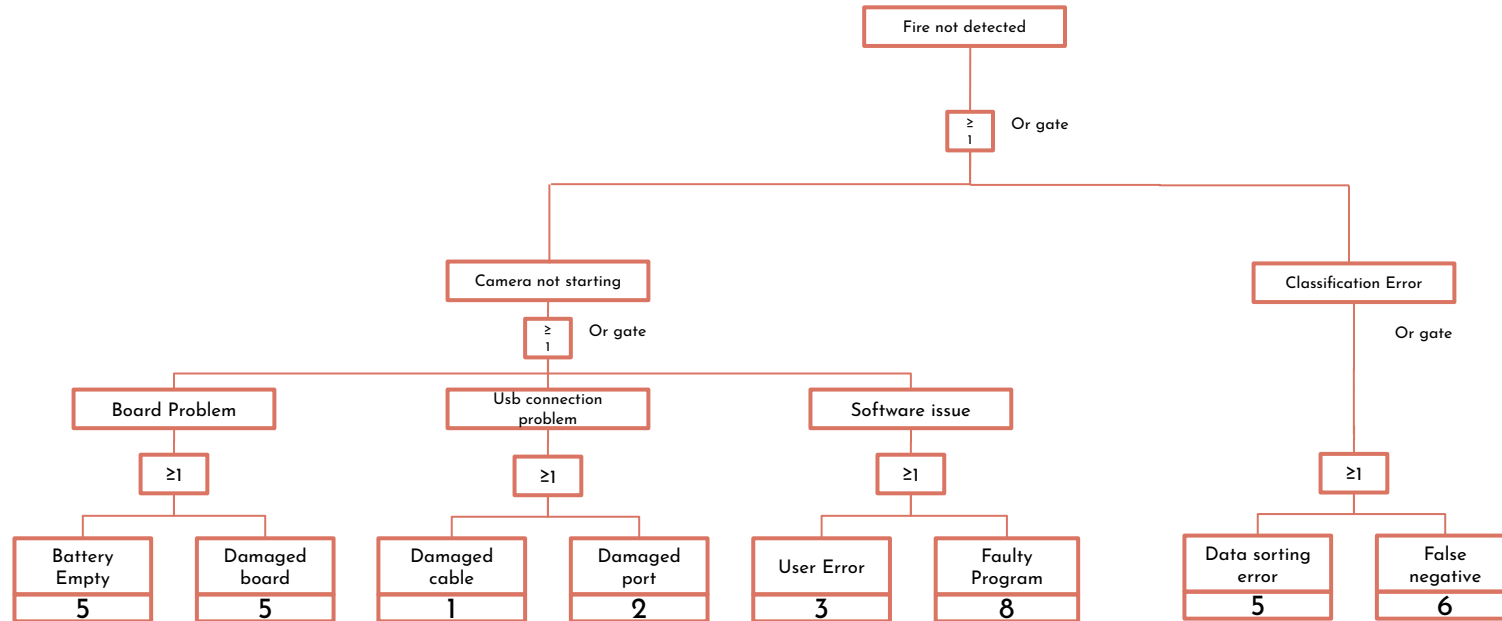


Standard 3: Avoid using floating point value in comparative blocks when possible

Config management





Failure tree example



02

DIRECTION AND MOVEMENT

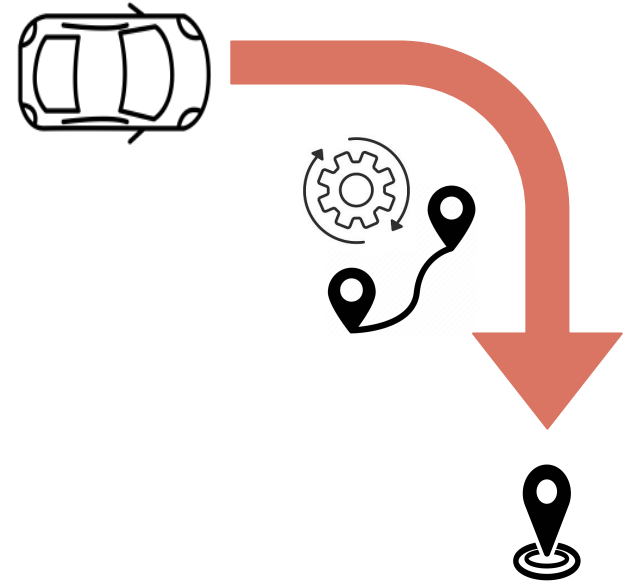
Stories

-  **User Story 1:** Direction and movement between two GPS location with real time management
-  **Test:** The car goes autonomously to a GPS location given and stop at it with a 50 cm accuracy

02 DIRECTION AND MOVEMENT

Movement routine :

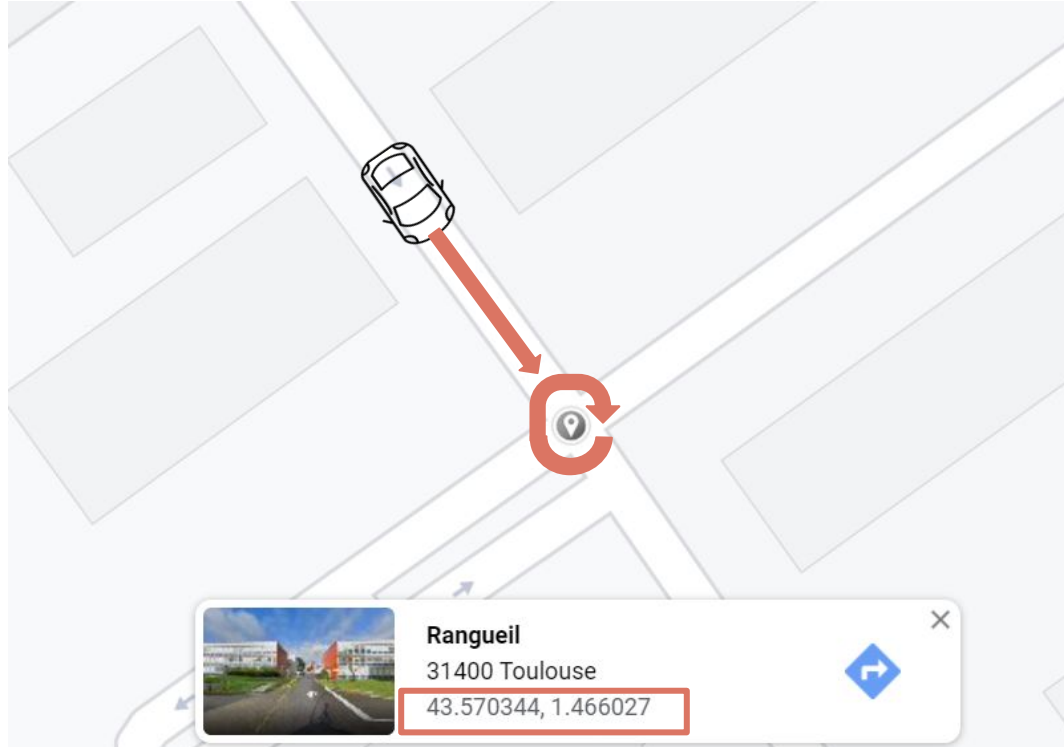
1. Receive the GPS coordinates (latitude and longitude) of the location we want to join
2. Receive the GPS coordinates of the car
3. Compare the two locations calculating the distance and the angle between the two
4. Calculate the angle command to align in the correct trajectory and the speed command



02

DIRECTION AND MOVEMENT

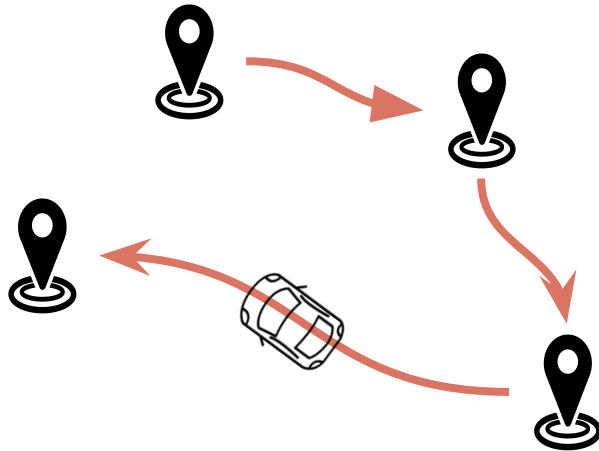
Test description



02

DIRECTION AND MOVEMENT

Next improvements





OBJECTIVES

- Test the direction management
- Movement between several GPS locations
- Receive the GPS locations path send by a user

02

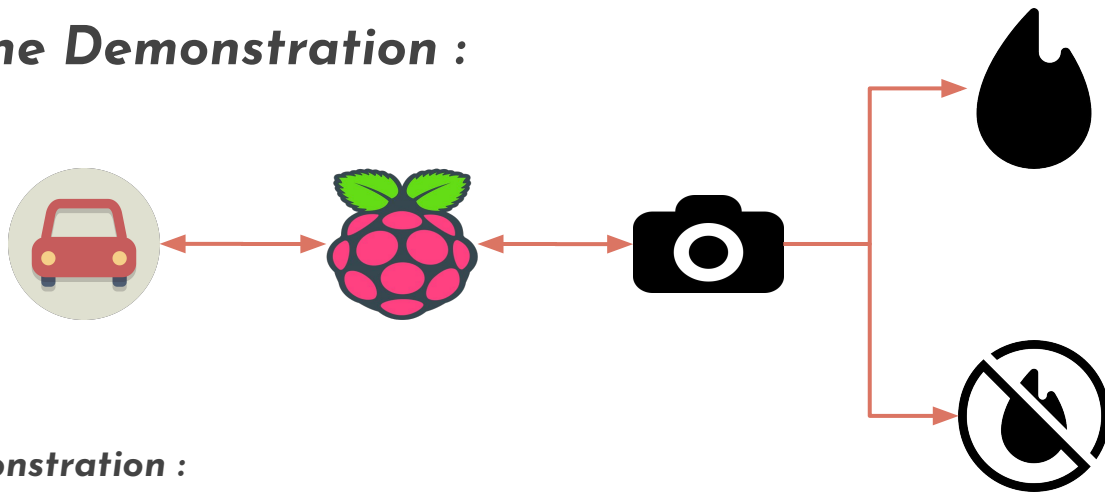
COMPUTER VISION

Stories

-  **User Story 1:** The car should analyze the right amount of pictures when arriving at a location
-  **Test:** Program a routine, start the car and check the predictions. Car should have a 90% success rate overall

02 COMPUTER VISION

Detection Routine Demonstration :



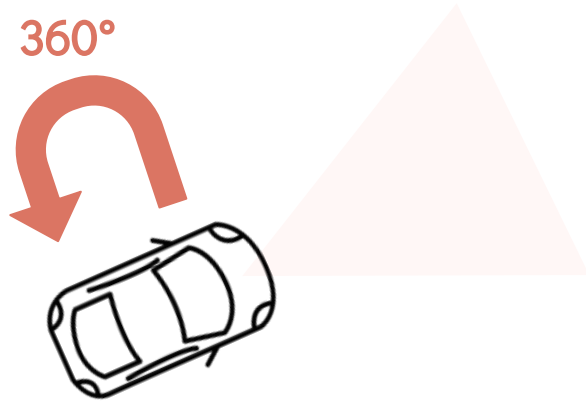
Detection Routine Demonstration :

- The car takes and analyzes the right number of photos
- The predictions have expected success rates

02

COMPUTER VISION

Next improvements





OBJECTIVES

- Develop the complete routine with movement
- Communication with the website
 - Send the date of the picture
- Machine learning improvement
 - Test of specific images
 - Optimize the processing speed with Jetson Nano

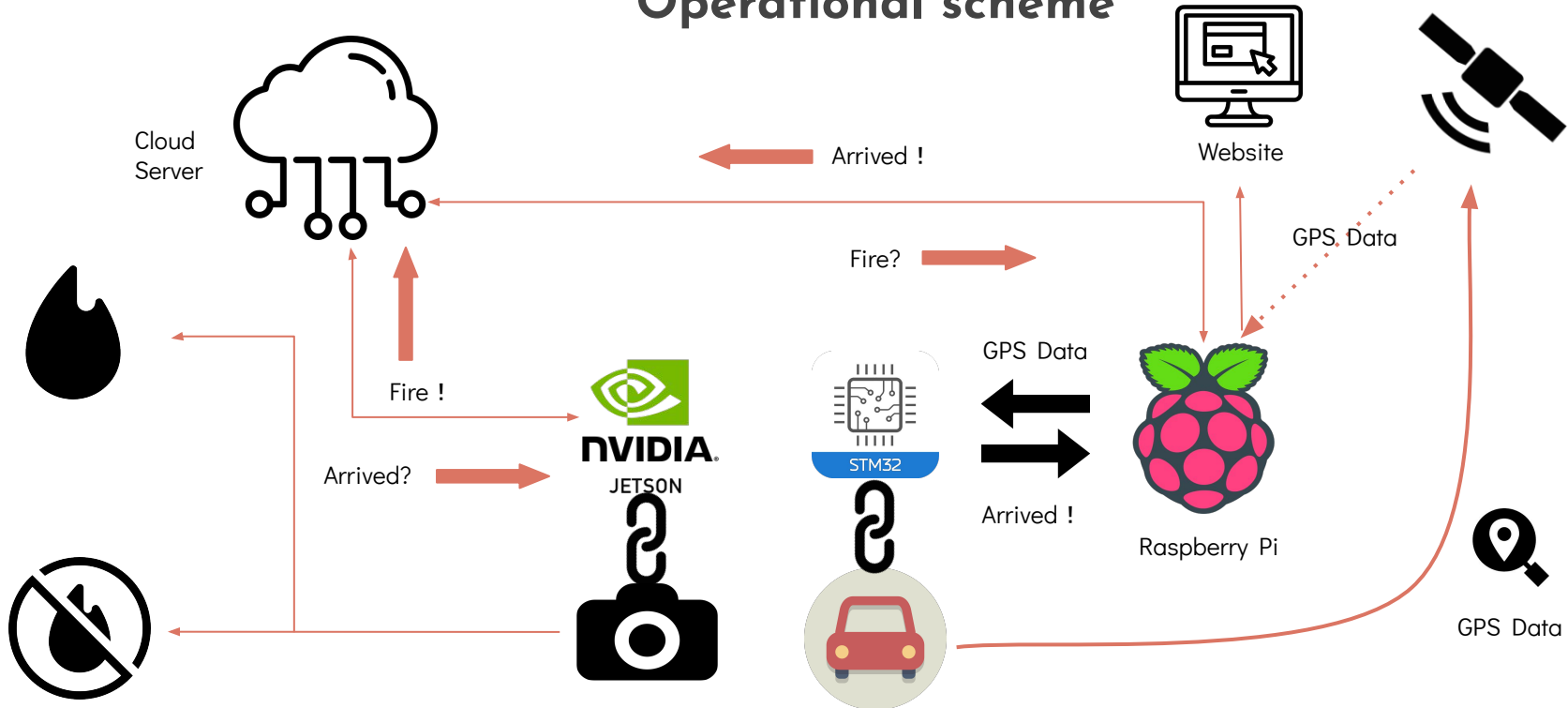
02 WEBSITE AND COMMUNICATION

Stories

-  **User Story 1:** Sending the processed GPS data to card Nucleo for the use of motor control and creation of 2 topics on Cloud (MQTT).
-  **Test:** The GPS information processed should be sent to the Nucleo card every 5 seconds. It can be verified on the software of observation of the Nucleo card.

02 WEBSITE AND COMMUNICATION

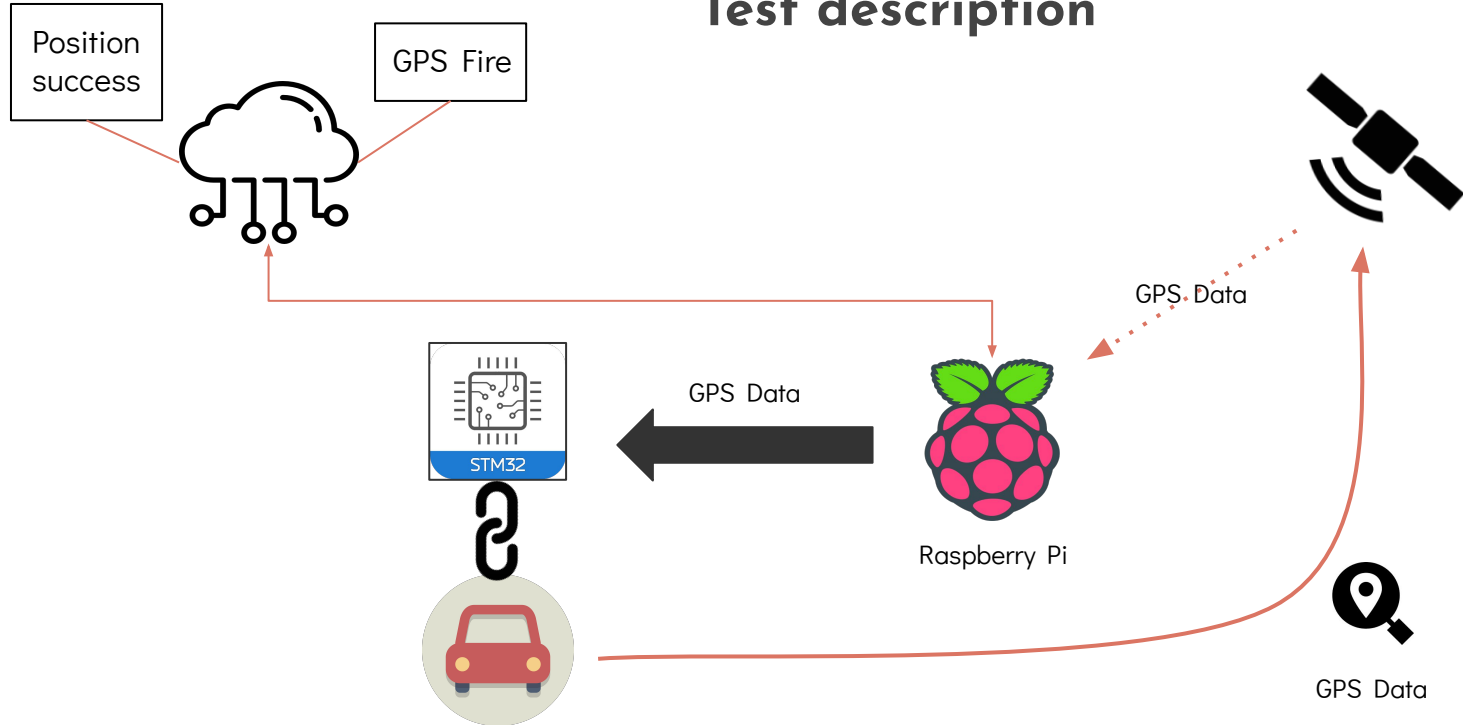
Operational scheme



02

WEBSITE AND COMMUNICATION

Test description



02

WEBSITE AND COMMUNICATION

Description of tests + remind acceptance quantitative threshold


- The current GPS coordinates sent to the motor control card with a period at least of **5 s**
- The car stops at the destination point within an error of **1 m**
- The time of initialisation of the GNSS (Global Navigation Satellite System) module is less than **5 mins**
- The GPS accuracy should be less than **50 cm**

03

NEXT SPRINT ?


EPIC (DIRECTION AND MOVEMENT / COMPUTER VISION / WEBSITE AND COMMUNICATION)

 User Story 1: *When turned on, the car should start its full work routine*

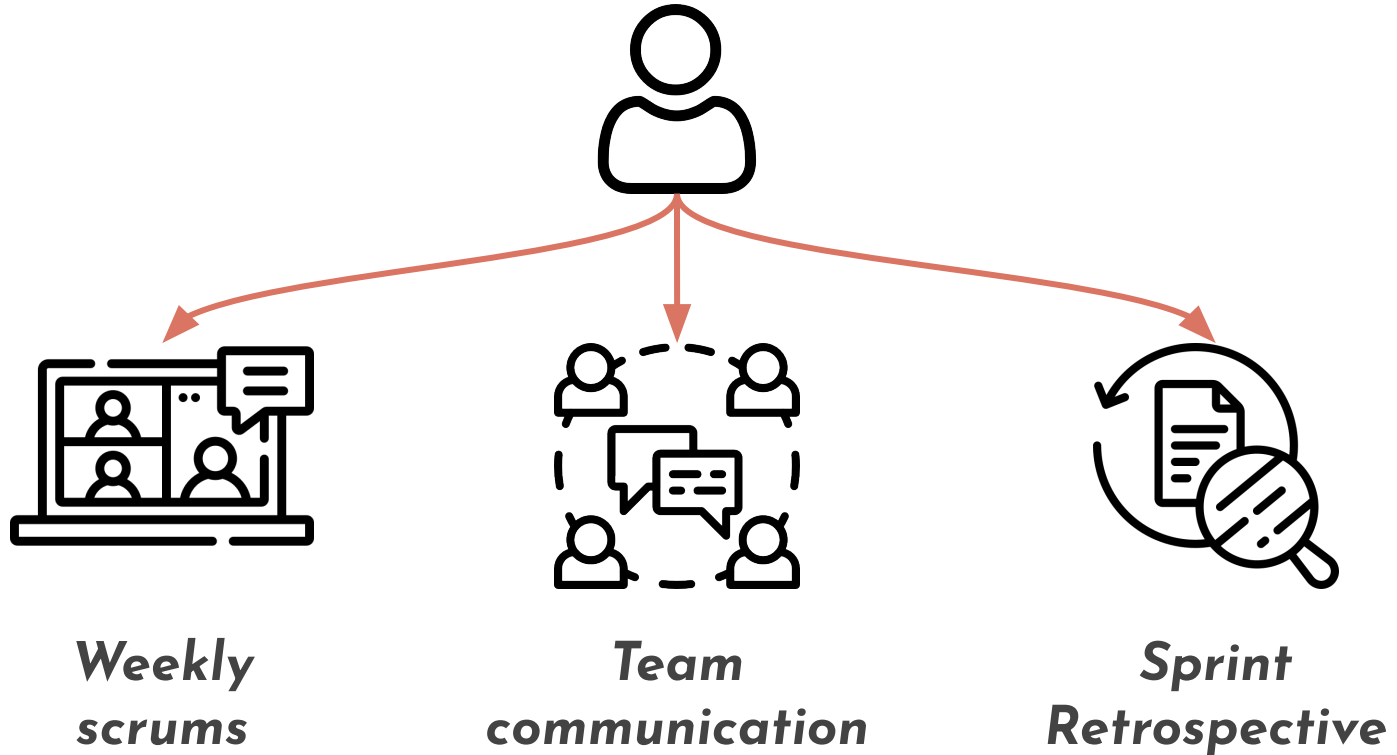
 Test: The car should go to the next gps location, check for fire outbreaks and update the website if needed. All without any exterior help.

EPIC (WEBSITE AND COMMUNICATION)

 User Story 2: *The website should automatically alert the user of a fire, display a photo and its position on a map*

 Test: Website should update in **5 s** max if a fire is detected + the fire well marked on the map + fire image should arrived on the website less than **50 s** after its detection.

03 Scrum master's role:



04

CONCLUSION

*Thank you for your
attention*