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SMARTSHUTTER

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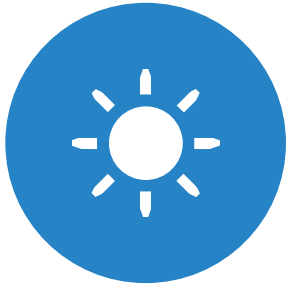
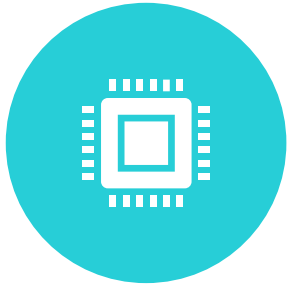
INTRODUCTION



In this project a natural light management system composed by smartshutters and an external light sensors controlled through a cloud application is presented.



Each smartshutter node is composed by an actuator to control the shutter position, an internal light intensity sensor and a presence sensor.

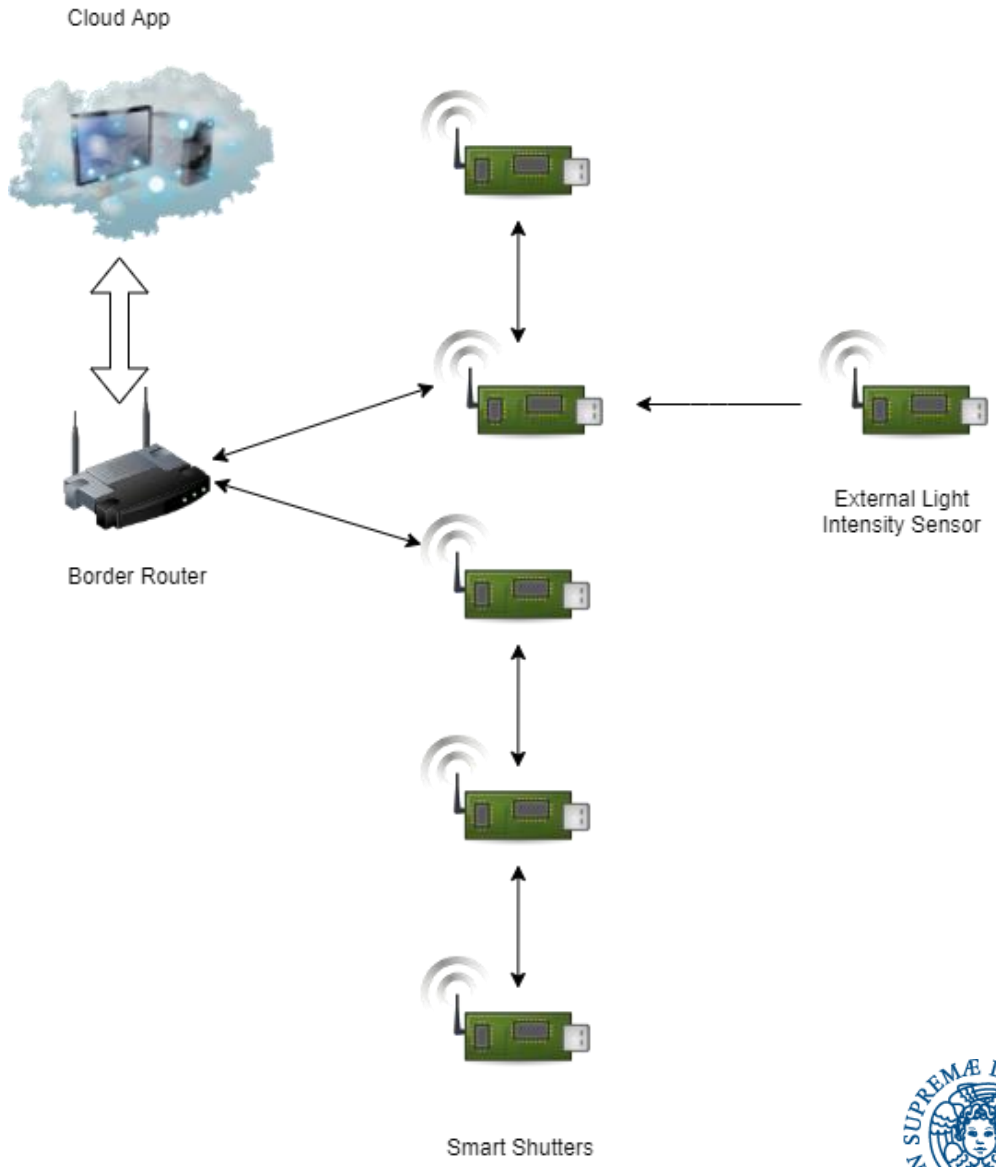
NODES STRUCTURE

The External light sensor node will read the light intensity outdoor.

The internal light sensor will read the light intensity indoor and will also be used to set the shutter level while in automatic mode.

The actuator can move the shutter in 11 different positions (from closed to fully open with 10% steps). The actuator can be set in manual or automated mode, for which target light intensity can be customized.

A presence sensor is present in all smart shutter nodes in order to detect obstacles. When an obstacle is present the actuator will not be able to move down the shutter in order to avoid any kind of damage.



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SMARTSHUTTER NODE

The leds are used to give some information about the status of the node.

- The green led will indicate if a node is registered and functional.
- The yellow led is on if the actuator is in automated mode.
- The red led is on when an obstacle is detected by the presence sensor.

The button can be used to switch the actuator mode between manual and automated.

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CLOUD APPLICATION

A command line interface allows the user to inspect the data collected and change the status of the actuator.

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AVAILABLE COMMANDS: (use [node] -1 to execute for all compatible devices)
list - Show Available Resources
status [node] - print the status of resources at [node]
move [node] [UP|DOWN] [value](1:10) - Move [UP|DOWN] shutter at [node] by [value]
AUTO [node] - Enable auto mode for shutter [node]
MANUAL [node] - Disable auto mode for shutter index [node]
setTarget [node] [value](100:1000) - set target value for actuator [node] at [value]
PRESENT [node]  - Add obstacle on [node]
ABSENT [node]  - Remove obstacle from [node]
exit - exit
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```

When choosing to view data, the user is given access to data from the previous 5 minutes.

The actuator interactions presented to the user are:

- Shutter movement: The user can change the shutter position by opening or closing it by a certain amount of steps.
- Setting automatic or manual mode (the same feature available releasing the button).
- Change target light intensity for automatic mode.

ADJUSTMENTS DUE TO SIMULATED ENVIRONMENT

The newest observed value from the external light intensity sensor will be periodically sent by the application to all internal light sensors in order to mantain coherency.

To simulate obstacles the presence sensor status can be set from the command line interface provided by the cloud application.

The internal light intensity value will be calculated by the internal sensor from the outside light intensity measurment received by the application and the position of the shutter.