

Link to video presentation:

[https://www.loom.com/share/346d6d24994a4785ba6ff108885f2081?
sid=47c802be-b766-44fa-bf8a-
58b8eedd7a24](https://www.loom.com/share/346d6d24994a4785ba6ff108885f2081?sid=47c802be-b766-44fa-bf8a-58b8eedd7a24)



In the actual context of climate change, with the Mediterranean sea being 2 degrees warmer than the average temperature measured from 1980 to 2000, the risk of extreme weather events such as the latest floods in Valencia will only get higher.

Satellite images of Valencia before and after the floods

DESBORDAMENT

Rambla de Poio

17.10	100 m ³ /s
--------------	------------------------------

17.30	1000 m ³ /s
--------------	-------------------------------

18.30	2000 m ³ /s
--------------	-------------------------------

Font: Confederació Hidrogràfica del Xúquer

POLÒNIA
Avui, 22:05



#TotEsMou3Cat

10:38



673 370 122

Local tv program showing data of the rise in water flow rates. Presented by a famous Catalan weather forecaster, Francesc Mauri.

The Need for an Early Warning System



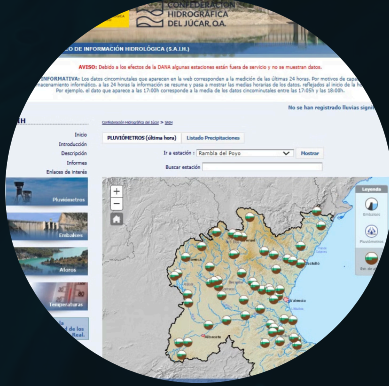
Lack of anticipation and fatal consequences

Authorities failed to warn the at-risk population in time. The floods caused more than 200 deaths.



Automated system
to alert the
population at risk of
flash floods caused
by intense rainfall

System Operation and technical implementation using Python



```
def test():
    # disable gpu
    chrome_options = webdriver.ChromeOptions()
    chrome_options.add_argument("--disable-gpu")
    driver = webdriver.Chrome(chrome_options=chrome_options)

    # the dropdown is visible (use a wait condition here)
    driver.wait(driver, 15)

    # wait until the dropdown is visible
    driver.wait(driver, 15)

    # a more general selector to try and find the right station option
    e = WebDriverWait(driver, 15).until(
        EC.presence_of_element_located((By.XPATH, "//option[contains(text()), '']"))
    )
    e.click()

    # button
    button = WebDriverWait(driver, 15).until(
        EC.element_to_be_clickable((By.XPATH, "//button[contains(text()), '']"))
    )
    button.click()

    # clicking search button: (e)
    driver.quit()
```



Web scraping

Automatic acquisition of real time flow rate measurements from hydrographic centers using Selenium and Chrome Driver libraries



Analysis

Comparison of current levels with established risk thresholds. In case the max level is reached or surpassed, geolocate the station or stations with alarming flow rates and make use of Copernicus satellite data to find out what areas are at risk of being affected by the sudden floods.

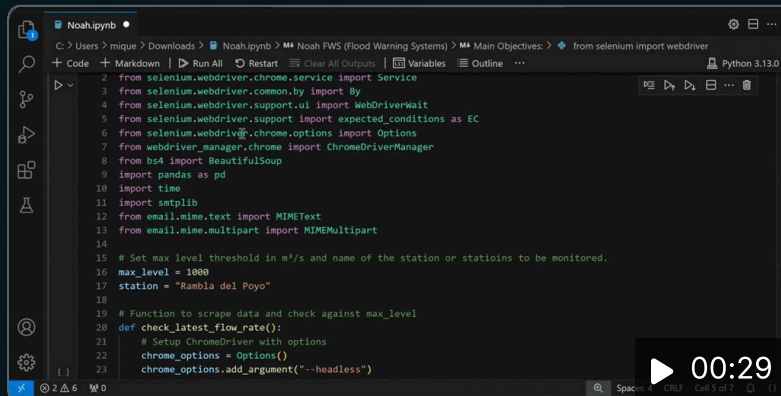


Alert Activation

Send notifications to local or regional authorities and activate sound alarms in towns to alert the population at risk of being affected by the coming floods.

The code does not need to be constantly running 24 hours a day, 365 days a year. Only when red alerts are notified by national or European weather agencies for forecasting heavy rainfalls.

Once the alert is notified, the code can be in execution monitoring water flow rates that are being registered every 5 minutes at the Hidrographic Center website.



```
1 from selenium.webdriver.chrome.service import Service
2 from selenium.webdriver.common.by import By
3 from selenium.webdriver.support.ui import WebDriverWait
4 from selenium.webdriver.support import expected_conditions as EC
5 from selenium.webdriver.chrome.options import Options
6 from webdriver_manager.chrome import ChromeDriverManager
7 from bs4 import BeautifulSoup
8 import pandas as pd
9 import time
10 import smtplib
11 from email.mime.text import MIMEText
12 from email.mime.multipart import MIMEMultipart
13
14 # Set max level threshold in m³/s and name of the station or stations to be monitored.
15 max_level = 1000
16 station = "Rambla del Poyo"
17
18 # Function to scrape data and check against max_level
19 def check_latest_flow_rate():
20     # Setup ChromeDriver with options
21     chrome_options = Options()
22     chrome_options.add_argument("--headless")
```



Loom

Re: - 20 November 2024

00:29



Next Steps

Integration with EFAS

Collaboration with the European system to improve coverage.

Geographic Expansion

Implementation in more flood-prone regions.

Continuous Improvement

Refining the system based on feedback and new data.

Thank you for your attention