## Contact Information

## Skills

Python

QGIS

Natural risk management

Environmental modelling

Remote sensing for environmental applications

Probability

Matlab & Simulink

Data analysis

Data visualization Machine learning

## Languages

**Italian**

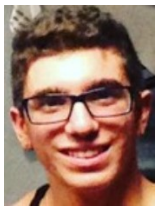
Native

**English**

Intermediate/fluent

# Giorgio Meschi

**GIS analyst**



I recently got experience as **GIS analyst** working at CIMA foundation Wildfire department. Regarding my background, I have a master degree in **Engineering for natural risk management** and a bachelor's in **Environmental science**. My profile is highly multidisciplinary due to my university studies and my working experience. I deal with **risk** assessment due to natural events, in particular wildfires events and I got the fundamentals of **computer science** and **data analysis.**

I work daily with **Python** and other software like **QGIS** and I love coding.

Moreover, I have experience in Machine Learning models.

## Experience

### GIS analyst (scholarship)

**CIMA Research foundation**

Savona (SV, Italy) *Aug 2021*

Continuation of the previous internship at CIMA research foundation through a research scholarship.

Experience in **spatial data analysis** using **Python**. **Data visualization** using python and **QGIS**.

Participation in project related to Wildfire risk assessment with the mapping of susceptibility, hazard and risk.

**Developement** of a **QGIS plugin:** possibility to generate a wildfire susceptibility map for the end user selecting some input files (rasters and shapefile). Author of a **pubblication** in **Fire** journal (**Q1**) named: Defining Wildfire Susceptibility Maps in Italy for Understanding seasonal forest fire regimes at National level.

Team member (non-key expert) in the EU project **PPRDEAST** phase 3: Prevention, Preparedness and Response to natural and man-made disasters in Eastern Partnership countries. I collaborated in other different main projects for important institutions like **WorldBank** and **UNDRR** at both international and national level (i.e. civil protection) (see the project section)).

### Data Scientist (Intern)

**CIMA foundation**

Savona (SV, Italy)
*Feb 2021 - Aug 2021*

Growing experience in **exploratory data analysis** and data **pre-processing** for **Machine learning** models using **Python.**

ML algorithms and techniques for mapping the **wildfire risk**.

**Post processing** techniques using python and **QGIS** on raster and shapefiles.

Data processing and **visualization** using QGIS.

Automatization of the main machine learning model for wildfire susceptibility evaluation in python.

knowledge about **Reporting**, communicate the results and data **presentation**.

### Engineering for Natural Risk Management

*Oct 2018 - Dec 2020*

Savona (SV, Italy)

*Dec 2019 - Currently*

well. Assess the Risk, usually in terms of maps, based on the previous evaluations.

All the processes of the **risk management** are studied, from identification to analysis passing trough the assessment and the communication with stakeholders and populations.

Knowledge about the Remote sensing techniques for natural disasters with the goals to catch information useful for risk prevention, damage assessment and estimation of physical parameters that can be used as input in different environmental models. Fundamentals of exploratory data analysis by using different programming software like Matlab, Cplex and Python.

Genova (Italy)

*Jun 2018 - Jul 2018*

Rapallo (GE, Italy)

Lavagna

*Jun 2015 - Sep 2015*

**UNIGE**

Knowledge about the main different types of **natural events** that can be a **risk** for human health, economic activities and environment ecosystem.

Ability to evaluate the hazard of different type of events, vulnerability relate to the population, buildings and environment and exposure of element at risk as

Student

### representative

**Natural Risk Management**

I was the student representative of the master course in Engineering for Natural Risk Management furthermore, I was member, as student, at the peer commission of Genova engineering department. Both activities are useful to understand and link the students opinion with the professors teaching activities for giving a contribute in providing a better service to the next students.

### Consultation activity

**Industria&Ambiente**

**Risk Analysis relate to the presence of clorurate substances in groundwater.**

The work, developed in the bachelor thesis, had the aim to discover if the people lived in a town upper the **groundwater** reservoir were at risk because of the presence of certain chemicals whose overcome the limit law concentration. modelling the situation we considered the main roots and ways in which these contaminants may have reached the people implementing the model in *Risknet 3.0 software. QGIS* was used to geo-reference the piezometers in the study area and *excel* was then utilized to make some statistical analysis. The parameters in the model and the model itself followed the **APAT-ISPRA guideline** relative to the risk analysis in polluted sites. At the end we elaborated a **technical report** for the interested authorities. This work allowed me to get the bachelor's degree with **full marks**.

To have a look of the presentation relative to this work clik here .

### Scrutineer

Several time I could have given my contribution on the vote management as scrutineer both in elections and referendum.

### Cashier

**Carrefour**

I worked as full-time cashier for the summer season after a period of stage in the previous year. Experience in cash management.
Partecipation in all the basic daily working activities in the grocery store.
Not continued due to the university studies.

## Education

Genova (Italy)
*Oct 2018 - 2020*

### Engineering for natural risk management

**University of Genova**

Master's degree in Engineering for natural risk management (110/110 cum laude).

Genova (Italy)
*Sep 2015 - 2018*

### Environmental Science

**University of Genova**

Bachelor's degree in environmental science (110/110 cum laude) .

*2017 - 2017*

### Sefaty course

General education course on the safety and healthy in workplaces.

Genova
*2015 - 2015*

### Bodyguard

**Academy security training**

Operator for controlling entertainment open space or public institutions activities.
Firefighter operator.
First assistance operator.

## Projects

**1) Defining Wildfire Susceptibility Maps in Italy for Understanding seasonal forest fire regimes at National level (paper - Fire - Q1)**

The aim of this paper is to describe a wildfire susceptibility mapping developed at the National scale for Italy.

Climatic, land cover, topographic, and variables are taken into account, as well as variables related to human activity. Those predisposing factors are linked to the synoptic past wildfires by making use of modern ML techniques, in order to obtain a model who could then produce the susceptibility mapping for the two different wildfire regimes that interest Italian Peninsula and Italian Islands.

The resulting susceptibility map is then further validated with the wildfires occurred in the 2021, assessing the prediction capabilities of the model in identified the more fire prone areas in the near future.

2) **production of a wildfire risk map of Bulgaria - A WorldBank project**

in this project in which I collaborated at CIMA foundation I have assessed the wildfire risk in Bulgaria at national scale, with 500 m spatial resolution. The main steps for reaching this result are 4:

a) assess the probability of having a fire through the generation of the wildfiresusceptibility map: This step was achieved by using a machine learning model based on the algorithm Random Forest Classifier.

b) assess of the Potential Intensity of the flame: we used a model for defining theintensity and generate the Intensity map at national scale, where the intensity is defined as how power a fire could release if it occurs in W/m2. the model is based on the evaluation of the rate of spread (m/h) that depends variables like slope, wind and fuel fine moisture.

c) assess the exposed elements: these are elements at risk when a fire occurs.

d) the combination of the 3 previous product allow to generate a final product, thewildfire risk: it tells the probability of having a fire which intensity is such high that could be damage structure of hurt people (more in general the exposure elements). the risk was normalized form 0 to 1 giving a certain level for each pixel of the map with spatial resolution 500 m.

**3) Defining an early warning system for wildfire events in Ethiopia - A UNDRR project**

In this project I collaborated for the technical part of generating both a susceptibility map and an Intensity map.

the method is very similar to the one explained in the first project, however, I have used my revisited model for the wildfire susceptibility map generation, that is, an implementation of the main ML model in Python (before it was written in R language). This was an opportunity to test the model several times while improving it throughout the project workflow.

**4) Classification of high resolution satellite images through a conditional random field model for climate change monitoring applications - Thesis project**

The work, developed in the master thesis, has the aim to get a high resolution land cover map in an area in Africa interested by climate change phenomena. The production of the land cover map was achieved through the application of a contrast sensitive conditional random field model and the iterated conditional modes algorithm, both implemented in Python framework.

The results are focused on the capability of the model of reaching homogeneity effects on area that shows the same class label compared with the classification map obtained from just the pixelwise term thanks to be a contextual method. another advantage of this model is the capability to preserve edges and boundaries between different classes.

**5) Flood risk map relate to Entella basin (Liguria region, Italy) - University project**

In the first place of this project It has been assessed the Hazard map based on GFI index, that takes into account only the topography; then the Exposure and Vulnerability assessment was included in the analysis. The vulnerability has been differentiated in social, physical and environmental to get the final population vulnerability, and then it has been evaluated the vulnerability of the point of interest in that area. The exposure assessment has been divided in population and point of interest exposure. The risk map was obtained thanks of a math representation of a risk matrix that shown the relation between the hazard level and vulnerability level associated to the exposed elements. Different parameters have been modified in order to obtain a more detailed analysis and a more speditive analysis, faster and useful in emergency cases.

**6) Production of wildfire Risk map in Python - University project**

The work has the aim to produce a static risk map of wildfires over the Piedmont region in Italy. A machine learning approach was used for identifying the probability of each point to be fired knowing some input data like the vegetaion cover and the areas burned in the past. The performance of a decision tree algorithm and a random forest algorithm are compared in the final assesment of the risk map through accuracy evaluation on some test data. to view the techinal relation click here here

**7) Simulation of ventilation in a greenhouse - University project**

The goal was to study the air circulation inside a greenhouse understanding the variation of the Temperature, Humidity and Hentalphy in time and in different layers considered in the model for the best management of the greenhouse and the plants grown inside as well. the simulation was made on Simulink environment with Matlab workspace support.

more information are available looking at the technical relation available clicking here .

**8) Evaluation of chemical risk due to Bossarino Landfill (Vado Ligure, SV, Italy) University project**

The aim is to evaluate the chemical risk due to substances on the population living in Vado Ligure. The work is based on the chemical risk associated with the substances that waste materials can release to the groundwater and the one that the stacks release in the atmosphere. The aim is to evaluate the concentration of some target substances that were passing the law limit to understand if they actually are a problem for the target population identified in the study area relate to the possible groundwater and wind path. the main roots are considered in the final concentration intaken by the people. gaussian model for air dispersion and a model based on the accumulation in time of a target substance are considered and implemented using Python. google earth software is utilized for identifying the sources and the paths. the main steps were:

- Hazard identification: Site and source, chemicals substances, paths, receptors,roots.
- Hazard assessment: Evaluation of the concentration of chemicals at the receptors.
- Exposure assessment: Exposure evaluation for chemical substances- Effect assessment: slope factor and reference dose evaluation.
- Risk evaluation: the risk for the selected substances is evaluated starting from thedata assessed in the previous calculus. to see the technical relation click here

**9) Water and sediment sampling and analysis (Genova) - University project**

Different transects was designed in front of the Genova Harbor with the objective to take different samples of the water and sediment at different distances from the coast and at different water depth, in particular each sampling consisted on:

- Secchi disk to evaluate the water transparency
- plankton fine net to capture the plankton
- Niskin bottle to catch different water samples at different depth that was thendivided in different part, a part for laboratory analysis and a part for the oxygen and turbidity evaluation.
- macro-fauna grab samples for the macro-fauna analysis
- organic matter grab samples for get samples then analyzed in laboratory- Mursel table application to sediments to estimate the oxygen content. laboratory analsysis:
- chlorophyll evaluation in water samples with spectrophotometer
- organic matter evalaution devided on total suspended particulate analysis,organic matter analysis in sediments, soluble organic matter analysis. - Evaluation of nitrogen and carbon in the sediments samples
- protein evaluation both on water and sediment with spectrophotometertechniques
- inorganic matter evaluation

we made also transect and samples on the Genova beach for analyzing the debris size and the artificial debris presence to estimate the anthropological impact in different season ( touristic and not) .

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## Sport

**Powerlifter**

Amateur powerlifting athlete joined to Genova Powerlifting club.

I compete at national level winning different medals in bench press **national championship** ( 3rd place in 2018 and 2019 as well ) and bench press national cup ( 3rd place in 2018 and first place in 2019) in the -74 Kg body-weight class.

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