



## Bianca Federici

Associate professor

✉ bianca.federici@unige.it

☎ +39 0103352421

### *Education and training*

1999

#### **Master Degree in Environmental and Land Engineering**

Experimental observations on bifurcations in braided riverbeds - 110/110  
cum laudem

Università degli Studi di Genova

2003

#### **PhD in Hydraulic engineering and environmental systems modelling**

Topics on fluvial morphodynamics

Università degli Studi di Padova

### *Academic experience*

2008 - 2019

#### **Assistant Professor in Geomatics**

University of Genoa

2019 - ONGOING

#### **Associate Professor in Geomatics**

University of Genoa

### *Language skills*

#### **English**

Independent

#### **French**

Basic

### *Research interests*

The research activity is carried out in different fields, strongly interdisciplinary and innovative, in particular for the monitoring and analysis of the environment both natural, with particular attention to coasts, rivers and landslide areas, and urban, with particular attention to the monitoring of bridges and 3D survey of cultural heritage. She experiments with the integration of traditional, GNSS (Global Navigation Satellite System), photogrammetric and laser scanning surveying techniques, as well as the analysis of spatially distributed data on a GIS (Geographic Information System) platform, integrated into GeoDataBases

and geographic portals for land management and the use of geographic data on the Web.

Her scientific training began in the disciplines of hydraulics, with her degree and doctoral theses, focusing on the problems of river morphodynamics. She then turned her attention to monitoring the river environment and tackled the problems of surveying the territory and mathematical methods for the statistical treatment of the observed data.

The research therefore focused on the study of an experimental methodology that could be applied to the short- and long-term monitoring of riverbeds, allowing fast and inexpensive surveys for areas of limited size. In particular, the analysis of the problems of interpolation and relative calibration of the interpolation parameters for the realisation of DTM (Digital Terrain Model) was addressed, adapting the survey according to the information analysed during the measurement campaign itself, through the use of a GIS archive and analysis tool.

The research activity has therefore turned to the survey using GNSS technology, which is particularly suitable for environmental monitoring even in emergency situations, in support of permanent stations. In particular, a permanent GNSS station was designed for continuous geodynamic monitoring, with particular attention to both technical and scientific aspects relating to the monumentation of the rock for the installation of the antenna. At the same time, a study was carried out for the creation of a network of permanent satellite positioning stations located throughout Liguria. To this end, two real time GPS (RTK) measurement campaigns were planned with reference to the regional networks of Lombardy and Piedmont to assess the effect in the RTK survey of the position of the point being surveyed, with reference to the spatial arrangement of the network itself.

Furthermore, exploiting the potential of GIS and DBMS tools in the management and analysis of spatially distributed spatial data, some issues of interest for land management were addressed, implementing appropriate GIS procedures for the study of territorial accessibility in impervious environments, for the production of risk propensity maps from river flooding and tsunamis, for the assessment of susceptibility to landslide triggered by rainfall, for the assessment of realistic satellite visibility, i.e. with automatic determination of obstructions obtained from Digital Surface Model (DSM), as a support tool for the planning of GNSS surveys, both static and for moving vehicles, for the analysis of anti-collision risk in logistic areas, for the evaluation of the contribution of GNSS for the prediction of intense meteorological events, as well as a DSS system for potential offshore fish farms.

Current research lines are: the localisation of heavy rainfall over a large and orographically complex area as a contribution to the forecasting of warning states; integrated modelling for low cost monitoring of landslides triggered by rainfall; the contribution of satellite technology to the study of mean sea level; precision and low cost positioning of moving vehicles in logistic interport areas, associated with a real-time anti-collision algorithm; 3D surveys both photogrammetric by drone for emergencies and laser scanning also on moving vehicles.

She has participated in several multidisciplinary research groups, and has been the scientific responsible for the University of Genoa of the INTERREG ALCOTRA CONCERT-EAUX and AD-VITAM projects, and of the NARVALO project, project winner of co-funding by ASI (Italian Space Agency). In 2010, she promoted the establishment of the university spin-off Gter s.r.l. Innovation in Geomatics, Gns and Gis. She promotes the use of free data and open source geospatial software, through the Italian Association for Free Geographic Information GFOSS.it, of which she is a member of the Board of Directors.