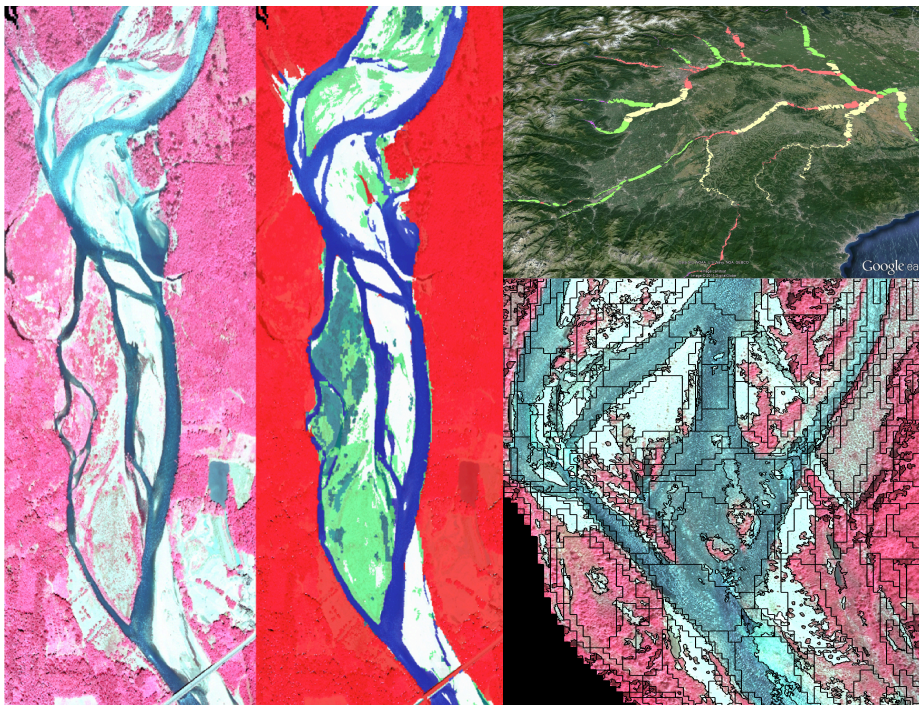# ICT & Remote Sensing for large scale monitoring of fluvial systems

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Abstract

Remote Sensing (RS) technologies over the last decade have made substantial progresses in terms of data accuracy, spatial coverage and temporal frequency of acquisitions. A valuable amount of information to investigate river systems has begun to emerge, which was not available in the past. RS data poses a number of data analysis challenges, which call for multi-disciplinary working groups where river experts work side by side with remote sensing experts and data analysts.

In this work, we use a regional available dataset in the Piedmont region (north east of Italy) acquired in 2008 including high-resolution multi-spectral images and LiDAR data to generate through semi-automated classification procedures a regional database of river geomorphic features. We have been able to detect meaningful relationships between geomorphic drivers (e.g. channel gradient, basin area, geology, geographic area), human pressures and channel features providing robust basis to generate a firsts assessments of river system alterations induced by human activities at regional level, and generating valuable evidences to discuss the design of more effective river management plans and rehabilitation measures. The developed ICT tools can be easily applied in the future in other contexts with similar data availability. That is of notable interest for the upcoming generation of data acquired by Sentinel satellites. Such amount of newly generated data is shifting the limiting factor for river science from data generation to data processing. Findings and tools developed for this work will be used as an exploratory example for a discussion on potentialities and challenges in the future of fluvial systems monitoring.

Simone Bizzi research's interest concerns the developing of modelling frameworks to describe and predict fluvial geomorphic behaviours and to investigate links between river hydromorphology and ecology. He obtained his PhD degree at University of Sheffield Department of Civil and Structural Engineering, Catchment Science Centre. Presently he is PostDoc grant-holder at Joint Research Centre of European Commission, Institute for Environment and Sustainability, Water Resource Unit and his research has focused on the use of remote sensing technology for characterizing, understanding and modelling fluvial systems.

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