GIS-based Framework and AI Approaches to support Decision Makers in Implementation of Climate-adaptive Design Solutions

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Urban and metropolitan settlements, due to the growing impacts of climate change, are highly at risk from critical hydro-meteorological hazards (HMHs), such us floods and heatwaves.
Future climate change scenarios require the implementation of resilient design solutions taking into account the climate projections, as well as vulnerability and exposure. In this context, we propose a GIS-based framework aimed at supporting decision-makers in designing long-term climate adaptive design solutions. The framework is developed starting from input data assimilation; then, using AI machine learning and decision-making techniques, are executed aggregations and classifications of urban physical features in order to assess the spatial distribution of vulnerability and risk indicators.
In particular, it is proposed a method to verify the resilient efficacy of nature-based solutions in reducing potential economic damages produced by coastal floods events, and simultaneously improving the open spaces heatwave vulnerability.