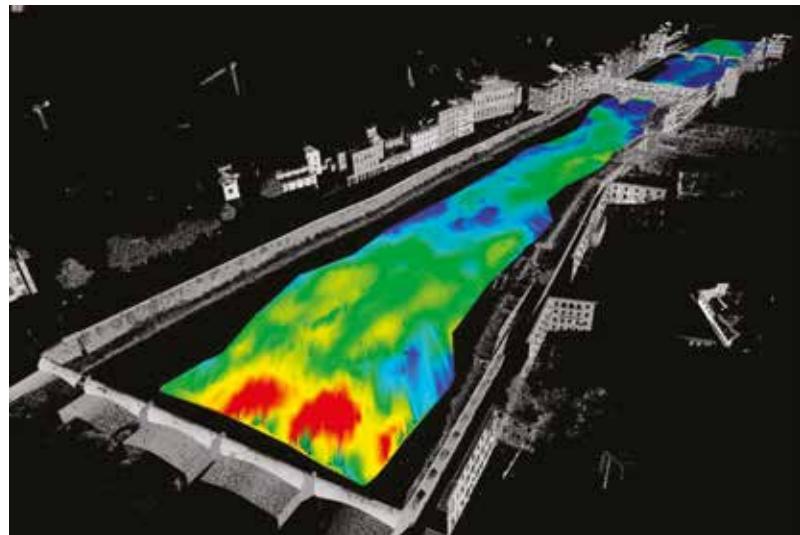


CASE STUDIES

PROTECTING THE ARNO RIVER AND ITS HISTORIC URBAN LANDSCAPE FROM CLIMATE RISKS

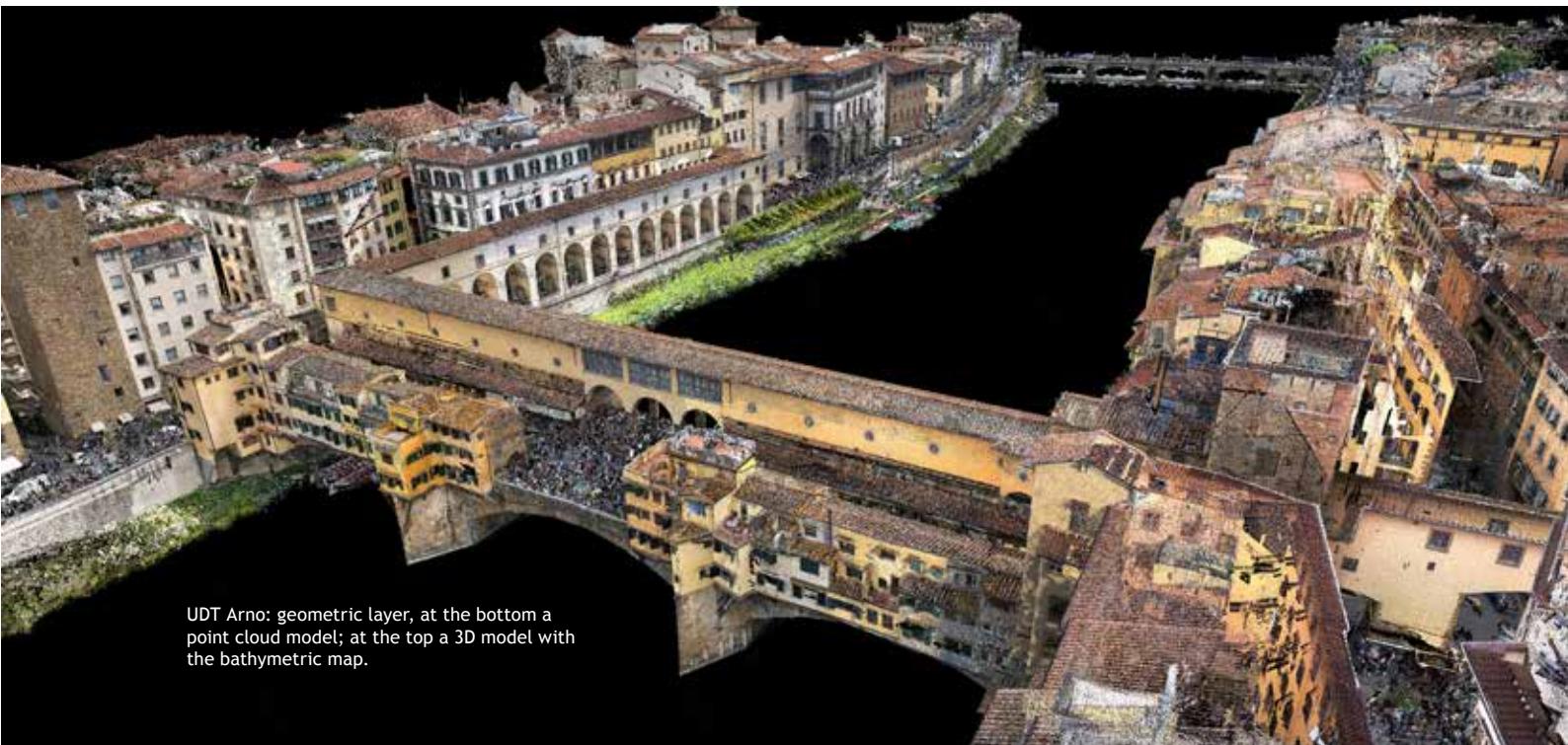
By GECo LAB

The historic centre of Florence, crossed by the Arno River and immersed in its landscape context, has remained virtually unchanged over the centuries, so much so that it was recognised as a UNESCO World Heritage Site as early as 1982. The awareness of the intimate relationship between landscape and architecture, between the river and the city, combined with the preservation of traditional building materials and techniques, has made it possible to preserve fundamental values such as integrity and authenticity. In recent years, however, the intensification of extreme weather events, the rapid deterioration of materials and infrastructure, and the growing impact of mass tourism have highlighted the need for advanced systems to monitor and manage urban



environmental risks. In this context, the concept of the digital twin is emerging as an innovative technological solution: a dynamic, updatable digital model that can faithfully reproduce a physical environment, enabling real-time monitoring, predictive analysis and long-term risk mitigation strategies.

The Arno River, together with its infrastructure and the urban fabric that surrounds it, is an ideal case study for exploring the potential of the Urban Digital Twin, a tool that enables assessments and simulations at both architectural and urban scales



UDT Arno: geometric layer, at the bottom a point cloud model; at the top a 3D model with the bathymetric map.