



Flood Risk maps for Drivers and Pedestrians

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Both in developed and in developing countries floods are the natural hazard affecting the highest number of people. Although the safety of people is the primary objective for flood risk management purposes, the actual circumstances of injuries and fatalities are often not included in flood maps and in risk mitigation plans. In fact, risk assessment is commonly based on the resident population in a flood prone area. Nevertheless, according to several studies, in the developed countries the majority of flood-related fatalities occurs outdoor, due to inappropriate high-risk behaviours such as driving and walking in floodwaters. In this work, a 2D hydrodynamic model is used to simulate the flood propagation using a high-resolution computational mesh in order to properly represent flood hazard in the road network. Several exposure scenarios account for the daily displacement of people based on open census data (e.g. age, occupation). Vulnerability curves for pedestrians and vehicles based on experiments, theoretical analysis and 3D numerical simulations and previously validated for another case study are applied. The vulnerability curves are used in combination with hazard and exposure maps to obtain risk maps capable of identifying critical hotspots for pedestrians and drivers' safety. The method is applied to a district of the city of Florence (Italy) in the right bank of Arno river, which hosts about 20000 inhabitants.