Public crowd-sensing of heat-waves by social media data

Valentina Grasso (1,2), Alfonso Crisci (1), Marco Morabito (1), Paolo Nesi (), and Gianni Pantaleo ()

(1) CNR Ibimet, Italian National Research Council, Florence, Italy (v.grasso@ibimet.cnr.it), (2) LaMMA Consortium, Italian National Research Council, Florence, Italy , (3) DISIT Lab, Distributed [Systems and internet | Data Intelligence and] Technologies Lab, Dep. of Information Engineering (DINFO), University of Florence, Italy

Investigating on society-related heat-wave hazards is a great issue concerning people health care. In the last two decades Europe has experienced several severe heat-wave episodes with catastrophic effects in term of human mortality (2003, 2010 and 2015) and there is a growing consensus, based on recent climate investigations, that this threat will represent an important issue for the resiliency of urban communities. Several important mitigation actions (Heat-Health Action Plans) against heat hazards have been already implemented in some WHO (World Health Organization) European region member states to encourage the heat response and preparedness. Nowadays the widespread use of social media (SM) offers new opportunities to indirectly measure the impact of heat-waves on society. A desktop/mobile web micro-blogging platform like Twitter can be regarded as a large, distributed network of mobile sensors that react to external events by exchanging messages (tweets). In this context the role of specific platforms dedicated to SM data extraction and appropriate big-data methodological approach is increasingly important. Thanks to these tools it is possible to semantically analyse all SM data and to explore their correlation with data related to thermal conditions as meteorological observations and weather forecasts. SM data may be used to verify the social impact of heat-waves and show where/when thermal conditions may become a social stress factor.

In this study a comprehensive view of the Italian heat-waves occurred in the warm months of 2015 are presented. Preliminary analyses of SM data retrieved through the Twitter Vigilance platform, developed by the Distributed Systems and Internet Technologies Lab (DISIT) of the University of Florence, were carried out thanks to a specific semantic channel in Italian language. Significant associations between daily heat-related SM data and thermal conditions have been observed. Main results of these preliminary investigations are presented and discussed.