AIR-URBAN: IoT and AI-enabled digital transition towards clean and safe urban mobility

Description

A key target of ecological transition towards the zero-pollution vision for 2050 is the prevention and control of pollutants. Transportation is a key source of urban air pollution, being the main responsible of NO2 and PM emissions, with a heavy toll on public health and wellbeing. This pressing need to monitor and reduce traffic-related emissions in urban areas calls for novel air quality models able to quantify theimpact of traffic. Moreover, there is a strong need to better assess the impact of the new mobility and urban planning policies to loweremissions adopted by many cities. To that end, novel microscopic models must be designed to provide the fine-grain estimation of roadtraffic emissions and urban air quality, both at local (i.e., at street level) and global (i.e., extrapolated for the whole city) level, with a very small time granularity to enable the identification of events with the strongest impact on pollution. Moving towards the digital transition of the mobility sector by putting in place the necessary sensing and computing infrastructure and intelligence, cities can obtain real-time traffic information which cannot be captured through simulated traffic models. The digitalization of mobility must leverage disruptive ICT technologies, such as Internet of the Things (IoT), big data analytics and Artificial Intelligence (AI). Furthermore, the edge computing paradigm, bringing computation closer to the data sources can enable more scalable and energy-efficient solutions with ultra-fast response times. However, it is the convergence of these technologies into a unified cloud-edge compute continuum concept that will shape the digital transformation of mobility, and the design of advanced applications and services for clean and safe mobility, with a tangible value for the ecological transition.

AIR-URBAN will conduct innovative interdisciplinary research, leveraging

- air pollution and quality modeling towards theecological transition for control and reduction of traffic-related air contamination, exploiting real traffic data to increase the accuracy andtime granularity of current models, and
- a unified compute continuum infrastructure upon which advanced big-data and AI analytics willbe deployed and executed to generate the required knowledge for air quality

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