

MODELAIR: Groundbreaking tools and models to reduce air pollution in urban areas

Description

MODELAIR proposes a combination of theoretical, experimental, numerical, and data-driven science that will simulate, control and design new disruptive technologies for future sustainable cities and will provide specialized training to 10 doctoral candidates (DCs) to make these new technologies available to city Councils and relevant industrial sectors.

MODELAIR contributes to EU Mission: Climate-neutral and smart cities, reducing gas emissions and offering cleaner air to citizens. MODELAIR will develop an Artificial Intelligence (AI) - based tool to help make informed and sensible decisions to control air pollution in urban areas. To do so, MODELAIR will develop novel analysis tools and new Reduced Order Models (ROMs) based on non-intrusive sensing and innovative data sources.

Assessed by the industry and city councils from Bristol, Brussels and Madrid, MODELAIR will improve the capability of current state-of-the-art modelling to consider the influence that buildings, roadways and other structures have on the flow and dispersion of air pollution. The limits of applicability of the novel AI-based tool will be tested in three specific problems related to air pollution in urban areas by:

- (i) studying the influence of urban topology on air pollution,
- (ii) characterizing the Ixelles District (Brussels-BE) to develop a real-time decision-making tool that will assess the disposition and maintenance of the sensor network to provide a high-quality air pollution monitoring service, and
- (iii) investigating the influence of the pollutant emission source (strength and location) to optimize traffic routes to reduce air pollution.

The final aim is to obtain transferable outputs using novel tools and methodology approaches (addressing three different challenges) to improve air quality dispersion models that will serve city councils and industries to develop new regulations to control air pollution.

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