Position Offered: POSTDOCTORAL RESEARCHER Project: *Data science and digital twins for transport and building emissions control*

Technological and scientific fields: Data analysis and integration, Digital twins, Demography, Advanced techniques in earth and ocean observation. New materials/control sensors. Urban energy efficiency and GHG emissions.

Location: IETcc, Madrid. https://ietcc.csic.es

Research Group/PI: IETcc / Fernando Martín-Consuegra and Borja Frutos

PROJECT SUMMARY

The main objective is to build an integrated urban digital twin that allows considering emissions generated by mobility, transportation and buildings. Data on residential buildings and transportation in the city will be included, with attention to energy consumption and emissions of polluting gases into the atmosphere. The model will allow for the analysis of various scenarios and measures that contribute to achieving cleaner and more efficient cities. The city of Madrid will be taken as a case study, although the results could be extrapolated to other cities/regions. The partial objectives are:

1) Data collection and data space. A realistic synthetic population must be generated and the models must be validated and this involves having detailed data on buildings, population, homes, pollution levels, atmospheric situation, vehicle flows, etc. This aggregated information in a common space will make it possible to address many issues such as energy poverty, the identification of the largest sources of emissions and resource consumption in order to reduce the environmental impact of cities and improve health.

2) Development and integration of models. We have experience in the development of mobility and energy consumption models in homes. The development of these models in Madrid, linking them to emissions and integrating the models between them will be a challenge that will be undertaken.

3) Study of scenarios. The model will allow pre-evaluation of improvements, costs and benefits, including an idea of the order of magnitude of the cost of potential actions.

PROFESSIONAL PROFILE

Minimum requirements:

• PhD and Knowledge of programming and Urban Data Science

Merits to be considered:

• Experience on social modeling, urban sociology, energy poverty

WHAT IS OFFERED

Collaborations with other groups of the PTI Mobility 2030, especially those in the project a group of IDAEA in Barcelona, IFISC in Palma de Mallorca and in IEGD in Madrid. Stays in these centers and visits to international collaborators. Formation program in AI (compulsory)

Contract conditions:

Indefinite contract for a Postdoctoral Researcher associated to the Momentum Project of 4 years' duration according to Spanish science law. Gross annual salary ($41.000 \in -52.000 \in$).

Start of contract: before 31 December 2024

PRINCIPAL INVESTIGATOR CONTACT

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