SORS/WomenInBSC: Development of data-fusion methods for air quality maps: The importance of imputing missing observational data in data-fusion methods

Objectives

Abstract: Ensuring reliable and accurate air quality models is crucial for decision-making and improving public health. This study aims to correct a regional air quality model CALIOPE, focusing on NO2, O3, PM10, and PM2.5 pollutants at a 1 km x 1 km resolution. The data fusion method used is universal kriging, merging observations from monitoring stations with the regional model.
The limited availability of PM2.5 observations for 2020-2022 in Catalonia impacted the performance of the data fusion method. To address this issue, Gradient Boosting Machine (GBM), a machine learning method, was employed to fill the observation gaps and improve the data fusion's accuracy.
Results demonstrate that the data fusion method significantly improved the performance of the regional model. Particularly for PM2.5, better results were achieved when incorporating data filled by GBM, emphasizing the method's dependence on observation availability.
For the ones interested in the methods applied in this work, there will be a hands-on session of 30 min after the talk in which the audience can run some of the techniques developed in R language. We kindly ask the people interested in participating in the hands-on session to bring a laptop with R-Studio adequately installed.

Short Bio:

holds a Bachelor's degree in Chemical Engineering and is currently completing her Master's degree in Industrial Engineering at the University Polytechnic de Catalonia. With a strong interest in environmental impact assessment and sustainability, she is actively involved in evaluating and correcting air quality models at the Barcelona Supercomputing Center.

Speakers

Speakers: Meriem Hajji Esstitou, Master's sudent in Industrial Engineering at the UPC
Host: Jan Mateu, Air Quality Services Es Group Recognised Researcher, ES BSC

Barcelona Supercomputing Center - Centro Nacional de Supercomputación

---