

## URBAN POPULATION MODELING: TOWARDS A BETTER PLANNING

### Abstract

This paper presents an innovative methodological framework for the forecasting of population density changes involved around urban areas. This forecast is based on a combination of statistical algorithms and artificial neural networks for the simulation and prediction of patterns and trends of population density changes. The procedure is implemented in the LULCC software package for land use change modeling written in the R programming language, developed by Simon Moulds. New code was developed in order to forecast changes in population density, and the Metropolitan Area of Mexico City (Metro-CDMX) was used as case study. First, maps based on historical trends of change in population density of the Metro-CDMX were used. These maps reflect population density for three moments in time (1990, 2000, 2015). Then, the data was complemented with input variables that reflect the geographic, socioeconomic and physical characteristics of the urban environment. Finally, the model was “trained” with those trends and variables, its accuracy was validated and ultimately the changes in population density were simulated. The forecasted year in the simulation was 2030.