**Suggested topics:**

GIS - Remote Sensing & GIS Integration

**Paper title:**

Probabilistic Urban Simulation in Ho Chi Minh City, Vietnam

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**Presenters Preference between oral and poster presentation**

Oral presentation

**Abstract:** Remote sensing has been recognized as an indispensable tool for urban and landscape planning. Regional or local census and survey data, such as population, income and transportation, are often collected to estimate the urban growth in time and space domain. Considering that insufficient detail investigations at locality may not available for developing and undeveloped countries, this study examines the capability of using remote sensing imagery in urban growth prediction, without using other ancillary data. Additionally, to incorporate uncertainties in urban modeling, different from deterministic approaches, this study developed a probabilistic urban simulation, which integrates logistic regression analysis and cellular automata, to predict urban growth for Ho Chi Minh City (HCMC), Vietnam. Specifically, the study was conducted by following four steps: (1) spectral linear mixture model (LMM) was applied to quantify fractions of land-cover types, including urban area, in HCMC from Landsat imagery for 1990, 2002, and 2010; (2) Explanatory variables extracted from land-cover types of 1990 and 2002 were used to estimate the potential area of urban expansion; (3) model parameters in a probabilistic-based cellular automata function was calibrated by monitored urban growth between 1990 and 2002; and (4) the model was validated by the monitored urban area of 2010, and was then applied to project the urban growth up to 2050. The simulation represented heterogeneous urban growth in time and space and predicted 15%-21% increase of urban area of HCMC from 2010-2050.

Keywords: Probabilistic urban simulation, Landsat imagery, logistic regression, cellular automata