

Spatiotemporal Analysis on Urban Transition and Human Mobility

Owing to developments in computer technology, we were able to structure a vast array of urban and human data as a spatiotemporal database compendium. Its most significant features are continuous auto-updating and extremely broad spatial coverage, comprising precise positional information. First, we discuss urban transition, i.e. predicted lot line modification and building reconstruction. Notably, we developed statistical models estimating possibility and probability that lots will be consolidated or split, and whether existing building stock is likely to be demolished, or remain, under land use transition. By proposing models and proceeding to numerical simulation, we assessed the effect of land use policy on the transition process of lots and buildings in those urban areas under investigation. Secondly, we discuss our spatiotemporal analysis of human mobility, in terms of people's movements and their behavior choice regarding public facilities. To this end, we devised statistical models to estimate spatiotemporal distribution of population, who continuously transit city areas, by developing a method of quantitatively extracting relevant transport expenditure versus performance. The study also proposes and demonstrates applications to disaster prevention planning and public facility planning.