# Introduction

Urbanization is a complex socio-economic process associated with geographical and cultural conditions. The urban land carries more than half of the world population and consumpts the most significant amount of food, water and energies and exports similar level of wastes like carbon dioxide, polluted water heat. Knowing the land to be occupied by urban provides opportunity for efficient resource using and waste neutralizing, thus prompt the sustainable urban development.

Cellular Automata (CA) have been widely applied for urban land projections. The existence of a cell in a CA model depends on its surrounding cells (neighborhood), which could be used to represent the urban dynamics in the real world. CA models are built on transition rules that composed by driving factors (e.g., topology, transportation, population etc.) and neighborhood status, and produce a transition potential map where each pixel indicating its probability to be urban in the future. For example, in two 9\*9 cell grids, the transition potential of the central cell with five urban cells will be, according to the transition rules, greater than the one with three urban cells. Similarly, the one close to road will have a higher transition potential than the farther one. However, different neighborhood status and the complex combination of driving factors make it hard to retrieve the optimum transition rules.