

Simulation of Pedestrian Movement Outside Football Stadium

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February 1, 2016

1 Problem Description

2 Literature review

3 Conceptual model

Cellular automata divides the simulation domain into regular cells. Each cell can be labeled as **allowed** or **forbidden** corresponding to the street and off-street area respectively. We build models for pedestrians and the floor and update their status based on the interaction between these two objects.

3.1 Inputs

In order to simulate the pedestrian flow outside Georgia Tech's Bobby Dodd Stadium, we need some real physical data about the stadium, pedestrians and street configuration around the stadium. Even though, variables like pedestrians' speed, space needed by people with different body sizes should vary individually, we use average value instead to simplify our simulation.

Velocity Follow reference ** and our own daily experience, we propose the average pedestrian speed is $1.34m/s$.

Cellular space Different people may occupy different size on the street. In order to take this fact into consideration, we take a square cellular configuration, in which each cell has edge length $0.3m$. And a pedestrian who requires more space will have empty cells round them. We generate a distribution of the empty cells by each pedestrian.

$$p(n) = e^{-\alpha n} \quad (1)$$

Map construction The stadium area is shown in Fig. 1. Using Google Map distance service, we get the west-east distance 483 meters and north-south distance 466 meters. [todo: insert a simplified map here]

Space of each pedestrian We know that different people may

3.2 Outputs

3.3 simulation components and rules

Floor model Static floor field:

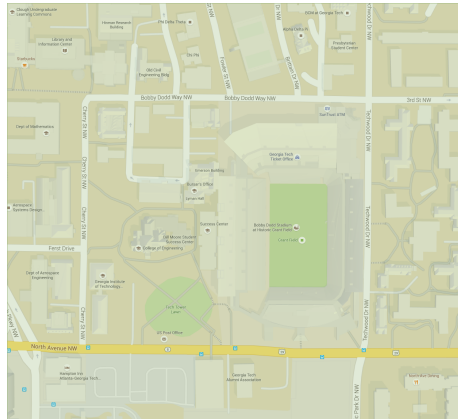


Figure 1: Stadium area from Google Map.

Pedestrian model

Transition matrix

Resolving conflicts

update strategy