**6 Simulation Results and Discussion**

6.1 Simulation

In order to simulate and to obtain some results to compare from our model, we implemented 3 functions that return the specific cost of every different simulation.

The 3 parameters that taken into account are:

* The time of each participant to reach the final table
* The average velocity of each participant
* The average total force applied to each participant

Time cost function

The time cost function takes into account the time required from each participant to reach the final table. It is the summation of the time to reach the food table (t1) and the time to reach the final table once the food has been taken (t2). The cost related to each person is equal to the total time required to reach the final table, and the cost of the simulation is the mean of the cost of each participant.

Velocity cost function

The velocity cost function takes into account the average velocity of each participant, in order to penalize the simulations where the participants are stuck and their velocity is equal or close to zero. Since the cost should rise when the velocity is lower, in this function the cost of each participant is equal to 1/v, where v is the mean velocity of each person. The total cost of the simulation is taken as the mean of the cost of each participant.

Force cost function

The force cost function takes into account the average force applied to each participant during the entire simulation. The cost of each participant is equal to the total force applied and the total cost is taken as the mean of the cost of each participant.

The simulation has been conducted by averaging the simulations with different parameters over 10 attempts each.

The parameters that changed were:

* Number of participants
* Number of tables
* Disposition of tables
* Distance between the food positions on the buffet table