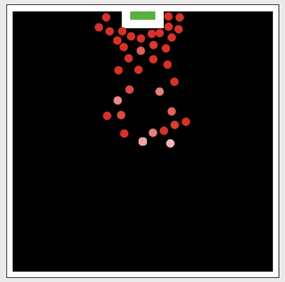

Pushy Jerks: a Bar Simulation

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Introduction

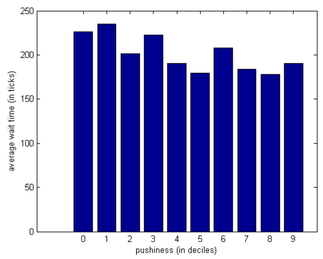
Pushy Jerks is a model for simulating bar crowds on busy, crowded nights. Its goal is to analyze how people with varying amounts of pushiness affect others in terms of how long it takes each person to get a drink. This is measured across the entire population as well as for specific subsets of the population.

Method

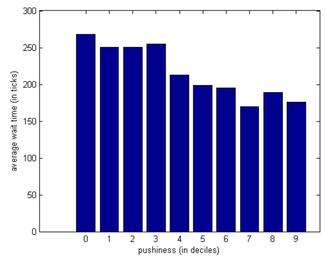
The Pushy Jerks model is build off of Dirk Helbing and Peter Molnár's social forces model, which has been widely used by others for crowd simulation. The model sees each person as a mass that is affected by various forces that it creates due to its surroundings. It has a force that drives a person towards his/her goal and repulsive forces that are results of obstacles or other people.

Results

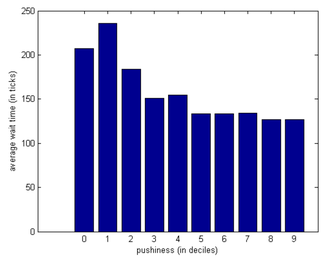
While keeping all variables constant and setting the lower-pushiness variable at 0.5, multiple simulations were run with increasing upper-pushiness values. For each simulation, the population was given a uniformly distributed range of pushiness values and split into deciles of pushiness values. After each simulation, the average wait time for each decile was recorded. From doing so the effects of a slowly increasing range of possible pushiness values can be seen, as shown below:



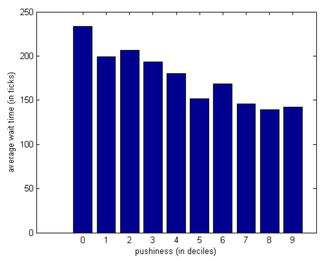
upper-pushiness = 0.6



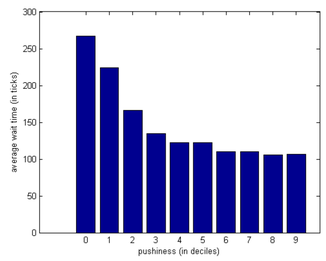
0.8



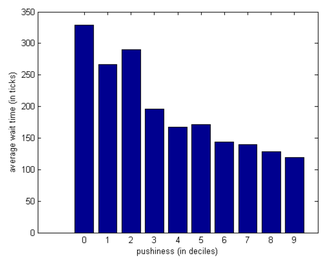
1.0



1.2



1.4



1.6

It was found that the distribution of average waiting times closely resembles an exponential distribution, with the pushiest people waving to wait as little half the wait time of the least pushy people.

Conclusion

Results from the Pushy Jerks model show that as the range of pushiness values increase, the distribution of average wait times per decile of pushiness decreases in the form of an exponential curve. This suggests that in reality it is possible that pushy people are unfairly and drastically affecting the wait times of those who are less pushy.

Literature Cited

D. Helbing and P. Molnár, "Social force model for pedestrian dynamics", Physical Review E 51, 4282-4286 (1995)

Further Information

My model and full report can be found online at http://modelingcommons.org/browse/one_model/3645