

# Marketplace Behavior Simulation

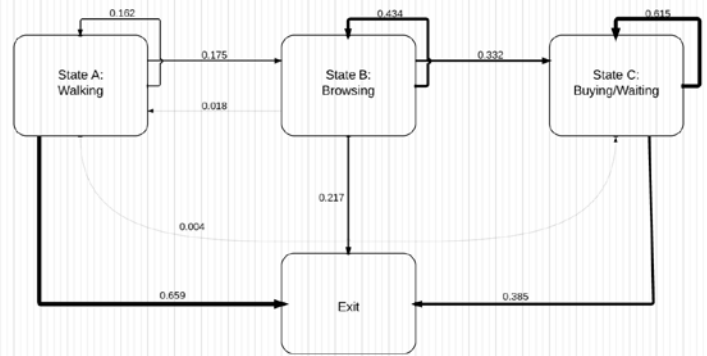
Elissa Wolf, Camille Jwo, Xinying Xu, Norman I. Badler  
SIG Center for Computer Graphics

Our research project is in the field of computer animation, crowd simulation, and psychological behavior simulation. Our primary goal is to build an empirically-derived behavior model for crowds in a marketplace environment, in which we include people's ages, genders and all other individual features in order to create a more realistic modeling.

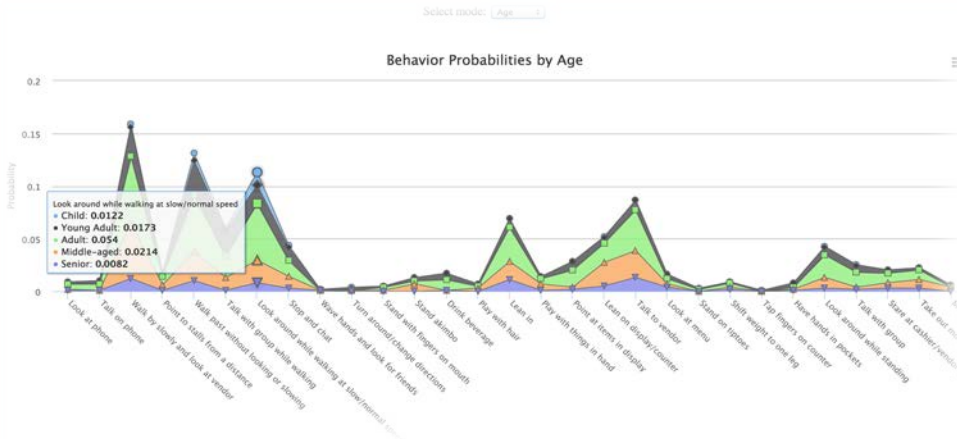
To do this, we first planned several field investigations of Reading Terminal Market, during which we recorded and summed people's behavior patterns and items they were carrying at a typical marketplace. We summed the results into several graphs, including possibilities of each behavior, and possibilities of transitions.

People in the marketplace can be in one of 3 states (walking, browsing, buying/waiting) that drive their behavior. The model is defined by probabilities of *transitioning* from state to state, and the probabilities of expressing each behavior given the underlying state. We found these probability distributions empirically for the entire population as well as by age, gender, and single/group status.

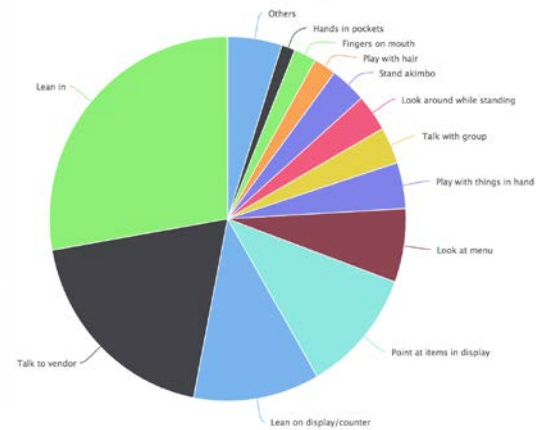
Probabilities of State Transitions



Behavior Probabilities by Age



Behavior Probabilities for Browsing State



The current results provide us with important parameters that we can later exploit in marketplace animation. Also, these behaviors form the primary behavior library that we will use in our marketplace simulation.

Future work includes:

- Transmit current data into parameters in Unity and Adapt
- Use motion capture to simulate primary behaviors
- Use probability model to build behavior trees for simulated items