

Queue Management Systems

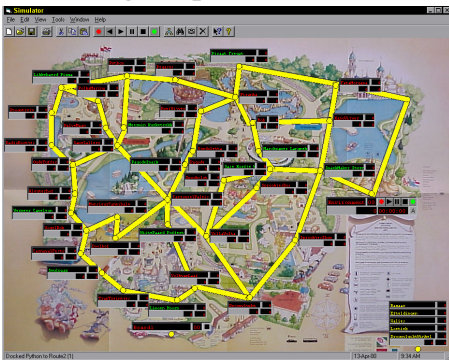
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Theme park visitors typically spend 20% of their time in attractions and more than 50% of their time waiting. The remainder is spent resting and walking. Declining visitor counts dictate action to improve the ride-to-wait and rest-to-walk (R2W) ratio.

Because the park's capacity cannot easily be increased, more effective use needs to be made of existing capacity. Therefore the need exists to collect detailed statistics on usage of all park facilities on a 15 minute basis. Various approaches exist already and their common approach is to equalize queue-size during the day and to allow the wait time for an attraction to be spent at a different place than the waiting line. This is also known as virtual queuing.

The Park Simulator

Modeling the park

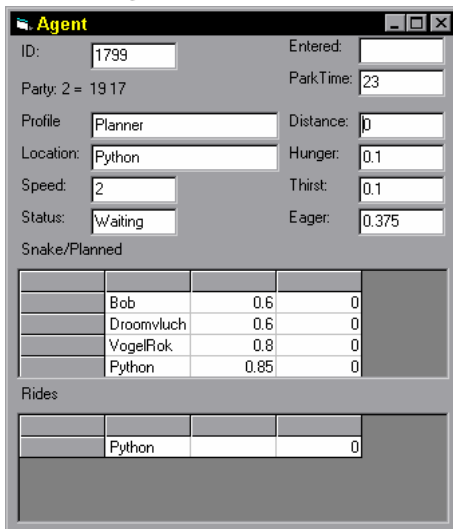


The Park Simulator is an advanced program that helps in collecting these vital statistics and calculates the possible effects of various strategies. After entering all attractions and the park's road system including direction signs, all attractions are tagged with the normal and maximum capacity, ride- and load time and the type of loading scheme. In addition a popularity matrix is supplied.

This information is used by the simulator to both calculate the waiting time and to determine the chance that a visitor will enter the waiting line.

For the road system all road connections, the length and the existing signs are provided.

Modeling the visitors



Based on a profile in which the age distribution and family size is defined, visitor groups are generated, called agents.

For every agent a behavioral pattern may be defined in the form of stereotypes like planners, hoppers, wanderers that determine how the agent selects an attraction.

Based on this behavior and a plan that the agent may have, agents will start to swarm around the park and enter attractions. Soon lines will start to form and the system keeps track of the actions of every agent.

The road system is used to calculate the walking time to selected destinations and the signs are used to help the agents find their way. Insufficient signs make agents loose their way just as real agents may during their visit.

The interaction between agents and attractions now determines the waiting times, the visitor flow through the road systems and the

occupation of restaurants and shops.

Testing new strategies

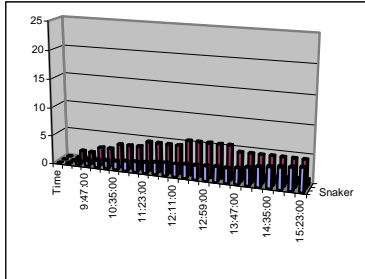
Once after a few test runs, the results are identical to real park data, the model is believed to be a good representation of the current park. Then the testing of new strategies may start. Many system parameters may be altered and in this way a study is made of the possible effects of the proposed strategies.

Visitor numbers may be altered, the road system may be modified and new signs may be added. In order to decrease waiting time several strategies are available as tools to study their possible effects.

Information signs

At various places in the park, information signs may be posted where the waiting times are displayed. Agents will use this information to determine their next ride. An expected result of this is that visitors will naturally flow to the areas of least congestion, thereby equalizing queue lengths. Placement of these signs may be important and the simulator will help determining the best location for such a sign.

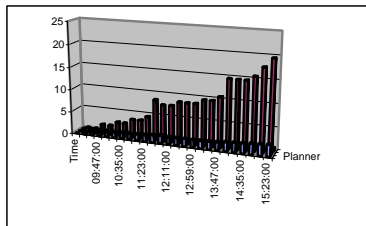
Waiting snakes



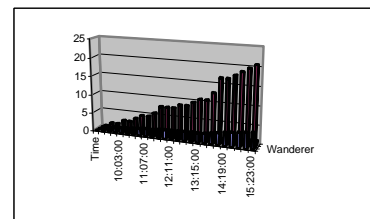
By allowing visitors to book several attractions in advance a kind of snake appears in which an agent, once past the waiting time may enter a number of attractions in sequence without having to wait in between. The actual waiting time may be spent in restaurants, shops or even in other attractions.

The park simulator keeps track of all bookings and also shows in its display and the statistics files the actual waiting times for all types of agents. So a comparison may be made to which visitor strategy delivers the best customer experience related to the R2W ratio.

From this it may be seen that people who participate in a snake, called Snakers, are visiting just as many attractions but at a much lower waiting time.



Planners and wanderers on the other hand seem to wait just as long, but wanderers visit more attractions and walk more. Different strategies may be defined and tested.



Using the results

When the results have provided enough information to select the best strategy, the park's infrastructure needs to be changed to accommodate the decided strategies. This includes placing information signs and providing separate entrances for the attractions with a waiting snake.

The Park Simulator will then assume the role of the actual control system, keeping track of bookings and providing customer information to snakers and planners. In addition the system will start collecting real data that results in updated information about attraction popularity and restaurant and shop turnover.

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