TJ Hallway Simulation
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Introduction

The people-traffic in the hallways at TJ is erratic. Some hallways and intersections are jam-packed between periods, during lunch, and before school. Others are deserted, save for three or four students standing in an alcove talking. My project models the traffic of people, both students and faculty, during the school day. Each agent has both physical and social factors coded into it which may change based on interactions with other agents. My program is easily alterable so that program variables (the school and agents) can be updated or completely swapped out without problems. Because the decisions are generated dynamically, the agents adapt to whatever environment they are generated in.

Abstract

Simulations are efficient ways to model data, once the framework is set up. By looking at a simulation, the user can glean any amount of information about a system (in this case, a school). A simulation of TJHSST could be useful not just to the administration is determining the effect of certain alterations to school policies, but also to visitors in learning the layout of the school and how to best interact with the diverse student populous. Simulations of TJ have been done before, but they were almost exclusively data (text- or number-based) none of them took into account the social interactions between students and faculty, therefore missing out on a large part of what makes a school tick. My simulation is highly visual and interactive to make it most-easily-understood. The data layer can include congestion, student-area density, average speeds, times to the next class, and time spent dawdling.

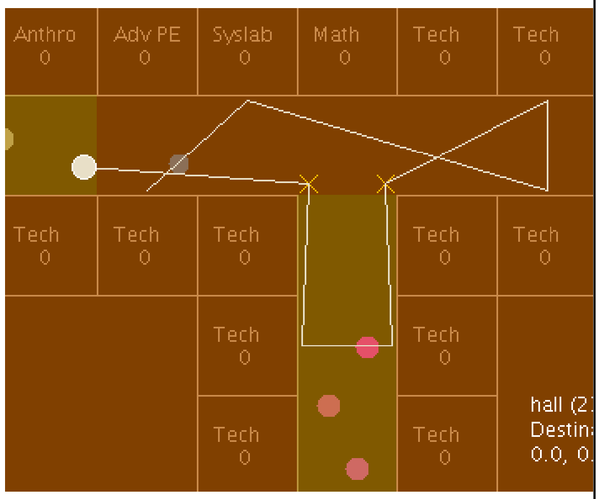

Fig 2: an agent demonstrates path-finding around corners and between classrooms.

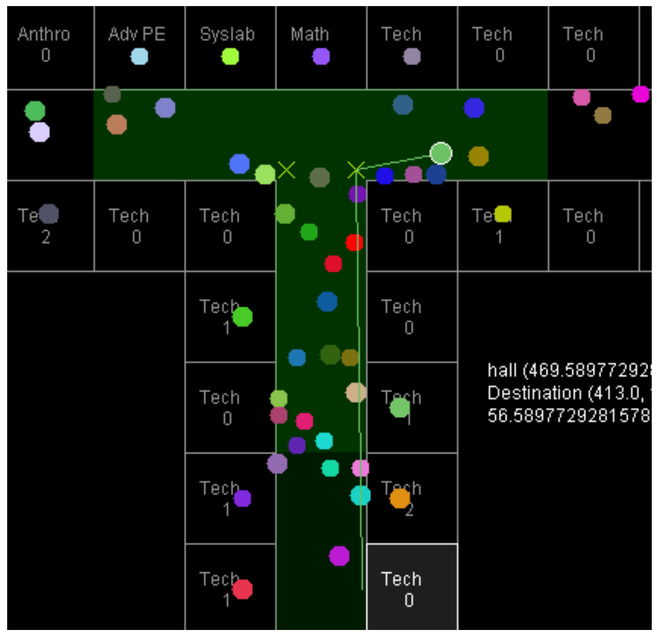

Fig 1: upper hallway populated with students, demonstrating path-finding, collision detection, and hallway density

Background

Simulations of TJ hallway traffic simulation have been done in the past, but they missed out on one of the factors that really makes a school – how the students interact with each other. Instead, their "students" were zombies who mindlessly traveled along the most direct route to their next class, not taking into account any friends they might pass in the hallway, not taking into account that seniors might hang out in the senior lounge between classes or that juniors can be most-easily found in the physics hallway at all times. Combining these types of student interactions with "social compatibility" algorithms will produce a superior simulation of the student population.

Developments

Control	Interface	Framework
• Mouse (improved) • Buttons • Keyboard commands	• Contextual information (improved) • Quantitative output • Buttons • Visual cues	• Precise grid • Path-finding • Staggered releases • Realistic spawn points • Collision detection • Student-specific scheduling

Data Interpretation

Now that my framework is robust enough for a full-blown simulation, I added hallway "blocks" to the mix. Each block will change its color and intensity based on the percentage of the total number of students contained in that block. The shift of the highest density of students is represented by the changing colored blocks.

Currently, my model provides accurate parallels to movement in the uppermost hallways. As IRL, the most crowded locations are the two intersections above Junior lounge and the library. Later, more hot-spots will be highlighted, once I add the bottom floor of the school.