Optimization of Navigating Intersections: A Research Project on Navigating Hallway Intersections During a Pandemic

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During the pandemic, many schools, workplaces, and public spaces went back into use, and people have established various guidelines and procedures to limit the spread of the virus by adhering to proximity rules of two-meter distancing and wearing a mask. One location that lacks guidelines are walkways since people are in motion. In this research project, actions and procedures limiting the proximity of people while maintaining a speed that meets the established benchmarks will be produced and optimized. To experiment with these procedures and models, the MassMotion Oasys crowd simulation will be used to understand the proximity of people, or agents, in relation to their time in proximity and the speed of their travels. Specifically, the simulation will focus on limiting the proximity between agents at three-way intersections of hallways to allow for people to safely navigate three-way in-person intersections during a pandemic. With the control hallway layout in the simulation, there are various barrier designs tested to determine which method allows for the least time in proximity and greatest speed in relation to the benchmarks. The benchmarks in this experiment are 1.236 m/s for the average speed and 1.307 m/s for the average desired speed. After conducting these simulations, I evaluated various layouts to conclude that intersections of hallways require the most attention in relation to proximity and that Layout D was one of the more optimal designs in relation to speed and proximity which modeled a small barrier dividing the flow at an intersection.

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