

Airport Simulation:	Themepark Simulation:	Subway Simulation
Description: Develop an agent-based model to simulate the rounds of clearing done by the workers based on the threshold levels of the bins.	Description: Develop a discrete event simulation model to simulate the queuing levels at each haunted house to compare the differences with pre-COVID and COVID measures in place.	Description: Develop a discrete event simulation to simulate a typical arrival and departure of passengers along an MRT line and how the average queuing times differ according to the interarrivals time of the trains and train capacity.
Problem/Motivation: Current cleaners go round the aircraft stands during their specified shift timings to clear the bins. With newer smart bins, however, the workers will be able to track the rate of the bins filling up with trash and hence there is no longer a need to keep going out to check the bins.	Problem/Motivation: In the upcoming Halloween Horror Nights in Universal Studio Singapore, there are new COVID measures in place to ensure safe distancing is observed. Therefore, this would adversely affect the queue times as the number of participants of each haunted house is now decreased.	Problem/Motivation: With upcoming newer MRT lines that increase MRT stations' proximity to working and living places, there is a considerable increase in the volume of passengers. Hence, with more passengers, this would result in increased levels of congestions. As a result, the interarrival times of the MRTs will be crucial.
Type of Model: Agent-Based Modeling	Type of Model: Discrete Event Simulation	Type of Model: Discrete Event Simulation
Ecosystem: <ul style="list-style-type: none"> Cleaner agents Trash bins with trash levels Airport grid layout (Aerodome map) environment 	Entities: <ul style="list-style-type: none"> 4 Haunted Houses Servers Participants generator and sinks Queues at each server 	Entities: <ul style="list-style-type: none"> Train (container) Passenger generator and sinks "Train station" to load and unload the train Queues at each "train station"
Rules: <ul style="list-style-type: none"> May check specific bins and neighbouring bins. Cleaners move to clear the trash at specific thresholds. 	Rules: <ul style="list-style-type: none"> Priority Queueing due to express pass. Moving on to the next haunted house based on the number of people in the queue (Some probability of departure). Assumes every passenger will be inclined to visit all haunted houses. 	Rules: <ul style="list-style-type: none"> Scheduled train arrivals. Random passenger arrivals (adjustable based on time period). A queue of passengers starts forming at the station if no train has arrived. Passengers go through a branch to either alight (and leave station) or stay in train.
Output of Analysis <ul style="list-style-type: none"> Frequency of clearing/Idleness of workers Time spent on the ground 	Output of Analysis <ul style="list-style-type: none"> Average Queue lengths of each Haunted House 	Output of Analysis: <ul style="list-style-type: none"> Average time spent in queue. The cumulative capacity of train at each event/time step.
Possible expansion: <ul style="list-style-type: none"> Incorporate flight volume to vary the probability of the trash on the runway, hence the rates of bins filling up 	Possible expansion: <ul style="list-style-type: none"> More attractions 	Possible expansion: <ul style="list-style-type: none"> Can focus analysis on stations that connect to other lines.