Plane Model Used

120 seats

6 passengers per row, total of 20 rows

No first-class cabin, no priority seating, every flight is full

Passenger

Each passenger is assigned a seat number

Each passenger is assigned a random number, 0 – 100 which represents the number of time steps that they need to load their luggage.

A passenger will not move unless there is enough space, two steps, between them and the person in front of them

If a passenger is moving, they will occupy any empty space in front of them prior to stopping (results in passengers bunching-up again as they come to a halt)

A passenger requires either one space in front or behind them in order to load their luggage

CHECK CONGESTION PARAMETER in CITATION

Passengers only load luggage in bins above their assigned seats

Factors Not Included

Effects of windows vs. aisle seats

Clustering of passengers into families or small groups

Other effects of human nature

\*States that reason is that “these effects are not likely to be the primary issue and consequently should not be the fundamental concern when finding the general strategy for a passenger boarding scheme.”

Algorithm

Based on Markov Chain Monte Carlo and METROPOLIS algorithms

Starting with an initial passenger order the airplane is loaded and boarding time is recorded

Then, taking that initial order, the positions of two random passengers are exchanged

Airplane is loaded with new passenger order and boarding time recorded

If the boarding time is as fast of faster than previous boarding time, the current passenger order is accepted, two new random passengers exchange positions, and the plane is loaded again.

If the boarding time is slower, the current passenger order is rejected, the order is returned to the previous order, two new random passengers exchange positions, plane is loaded again.

Process ends after ~ 10,000 iterations