

## ARTICLE TYPE

# Controlling Pandemic Spread In Your Office

### The Problem

Airborne pandemics are occurring rapidly. Each year, a small-size influenza pandemic occurs all over the world. An office, with a dense body count and long hours, is an ideal place for pandemics to spread, infecting multiple workers in the short term and causing disruption to the business. A government security client was interested in detecting and controlling the pandemic spread in its office building. The client was able to collect and provide a detailed spatial configuration of the office, PCR tests of most of the workers on a daily bases, and their relative location in the office during working hours using tag-based entering and leaving the room system.

### The Solution

The solution for this task is designed as a computer simulation that receives a real-life feed of individual's locations and makes a 15-minute prediction for infected between individuals' data. The simulation is based on the agent-based approach in two main scales: a room-scale and a building scale. The first takes into consideration the flow of pathogens in the room's air while the latter focus on the worker's movement. A detailed explanation of each of the components is available online in: <https://www.mdpi.com/2227-7390/11/2/426> and <https://www.sciencedirect.com/science/article/pii/S1007570421004639>. The combination of the two components with the real-time feed is currently confidential.

### The Outcome

The client tested using a smoke machine and several sensors the spread of particles in a multi-person scenario in a three-room configuration with minimal movement, due to the complexity of the experiment. The results show 82% agreement with the provided solution's prediction to the same configuration. Following this outcome, the system was deployed in one out of the two floors which are known to not mix. Following a 45-day experiment, the floor with the deployed solution presented 23% fewer sick days during this time.