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| **Project Name**: **Agent based model of COVID-19 transmission based on using mask in a super shop** |

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Abstract

The rapid spread of the corona virus disease (COVID-19) has become a global threat affecting almost all countries in the world. As countries reach the infection peak, it is planned to return to a new normal under different coexistence conditions in order to reduce the economic effects produced by the total or partial closure of companies, universities, shops, etc. Under such circumstances, the use of mathematical models to evaluate the transmission risk of COVID-19 in various facilities represents an important tool in assisting authorities to make informed decisions.

So we had planned a model named agent based model of COVID-19 transmission based on using mask in a super shop, where we mainly show that when we don’t use any mask then this virus how transmitted so easily one to another.

Different from classical mathematical models, agent-based approaches model individuals with distinct characteristics and provide more realistic results. In this paper, an agent-based model to evaluate the COVID-19 transmission risks in facilities is presented. The proposed scheme has been designed to simulate the spatiotemporal transmission process. In the model, simulated agents make decisions depending on the programmed rules. Such rules correspond to spatial patterns and infection conditions under which agents interact to characterize the transmission process.

Also this model also includes an individual profile for each agent, which defines its main social characteristics and health conditions used during its interactions. In general, this profile partially determines the behavior of the agent during its interactions with other individuals. Several hypothetical scenarios have been considered to show the performance of the proposed model. Experimental results have demonstrated that the simulations provide useful information to produce strategies for reducing the transmission risks of COVID-19 within the facilities.

## Introduction

On January 30, 2020, the World Health Organization declared the coronavirus disease 2019 (COVID-19) outbreak as a Public Health Emergency of International Concern.

COVID-19 is considered a very infectious disease transmitted from one host to another through different modes of transmission, such as airborne droplets disseminated by sneezing or coughing, direct physical contact, etc. In its transmission, an agent or set of agents like in our model based on mask protection are introduced into a population of susceptible elements.