World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:15, No:06, 2021

Physics of Decision for Polling Place Management: A Case Study from the 2020 USA Presidential Election

Authors : Nafe Moradkhani, Frederick Benaben, Benoit Montreuil, Ali Vatankhah Barenji, Dima Nazzal

Abstract : In the context of the global pandemic, the practical management of the 2020 presidential election in the USA was a strong concern. To anticipate and prepare for this election accurately, one of the main challenges was to confront (i) forecasts of voter turnout, (ii) capacities of the facilities and, (iii) potential configuration options of resources. The approach chosen to conduct this anticipative study consists of collecting data about forecasts and using simulation models to work simultaneously on resource allocation and facility configuration of polling places in Fulton County, Georgia's largest county. A polling place is a dedicated facility where voters cast their ballots in elections using different devices. This article presents the results of the simulations of such places facing pre-identified potential risks. These results are oriented towards the efficiency of these places according to different criteria (health, trust, comfort). Then a dynamic framework is introduced to describe risks as physical forces perturbing the efficiency of the observed system. Finally, the main benefits and contributions resulting from this simulation campaign are presented.

Keywords : performance, decision support, simulation, artificial intelligence, risk management, election, pandemics, information system
Conference Title : ICMS 2021 : International Conference on Modeling and Simulation
Conference Location : Toronto, Canada
Conference Dates : June 15-16, 2021