Title: COVID-19 in casinos: Analysis of COVID-19 contamination and spread with economic impact assessment

Abstract:

The COVID-19 pandemic caused tremendous disruption for casinos, with the virus causing various lengths of shutdowns, capacity restrictions, and social distancing strategies such as machine removals or section closures. Although most of the world has now eased off these measures, it is important to review lessons learned to understand, and better prepare for similar circumstances in the future. We present Monte Carlo slot floor simulation software customized to simulate players spreading COVID-19 on the slot floor. We simulate the amount of touch surface contamination; the number of potential surface contact exposure events per day, and a proximity exposures statistic in person-hours per day, under various social distancing and cleaning scenarios. Quantitative results are presented, as well as videos of simulated player movements around the slot floor, including flagged contaminations and interactions. The economic impacts of shutdowns, diminished player interest, and capacity restrictions are also explored, leading to insights that are valuable to operators in both the COVID and post-COVID eras. A by-product of this work is that it demonstrates the economic impact of reasonable slot floor reductions is typically negligible, and sometimes beneficial for slot floor performance. An analysis on the resulting slot count optimization will be presented.

Implication Statement

This simulation study allows us to analyze slot performance from an economic standpoint, and virus spread from a health and safety perspective. The work helps operators and government entities prepare for capacity restricted scenarios by keeping their players safe and minimizing the negative economic impact to the casino.

Bios:

Dr. Anastasia (Stasi) Baran is a Co-founder and COO of nQube Data Science Inc. She received her PhD in Electrical and Computer Engineering from the University of Manitoba in 2016, where she specialized in applications of non-linear optimization methods. Her combined interests in large-scale data modeling problems and the gaming industry have helped to develop nQube's AI-based slot floor optimization and player segmentation solutions.

Dr. Jason Fiege is CEO/Founder of nQube Data Science Inc. and Associate Professor of astrophysics at the University of Manitoba. He is a scientific computing, data modelling, optimization, and simulation expert with over 20 years of experience. He is the inventor of nQube's AI-guided evolutionary optimization and data modelling platform, and leads their research in slot floor optimization, AI-based player segmentation, optimization of slot segmentation, and other predictive AI systems.