The purpose of this project is to investigate the effectiveness of a mobile app integrated augmenting reality and GPS technology can influence crowd behaviour in the themed entertainment industry. In partnership with Dr. Ali Asgary, Associate Professor, ADERSIM, at York University, the study was conducted on the Anylogic Simulation system to measure how Disney characters can act as a crowd management tool to influence crowd movements throughout the Magic Kingdom. Using data to represent park entrance rates, attraction duration, and wait times, the study was able to capture the level of influence Disney characters had on park guest movements throughout their visit. This simulation reveals that Disney characters have the ability to influence crowd behaviour with a probability rate of 30%. This data supports the view that the proposed mobile app will act as an effective crowd management tool and can strategically influence crowd migration throughout the Magic Kingdom.

CROWDING AND CROWD MITIGATION

In an industry where safety and positive overall experience are the limiting factors for Disney’s success, developing effective crowd mitigation techniques has become paramount. The primary issue for parks and businesses within the themed entertainment industry is crowd management and crowd migration: a state of healthy and effective traffic (Chen and Lien, 2017). Crowds play a significant role in shaping theme parks and amusement parks. Walt Disney’s entertainment worldwide attracts 100,000,000 guests per year of its four parks (2015, 3, 5, 6, 8, 9). More specifically, the Magic Kingdom in one World 2016 attracted approximately 19,000,000 guests per year (2016, 3, 5, 12). Theme parks, particularly Disney theme parks, attract millions of people every year, understanding how crowd behavior and operation is significant to develop effective crowd management techniques.

PROPOSED MOBILE APP: DISNEY2GO

Using augmented reality and GPS technology, Disney2Go will allow guests to find and track their favorite Disney characters throughout the park. This mobile app will use GPS data to track the location of the guest and use AR technology to place characters in other less crowded areas of the park to encourage people to move to less crowded areas. Using data to represent park entrance rates, attraction duration, and wait times, the study was able to capture the level of influence Disney characters had on park guest movements throughout their visit. This simulation reveals that Disney characters have the ability to influence crowd behavior with a probability rate of 30%. This data supports the view that the proposed mobile app will act as an effective crowd management tool and can strategically influence crowd migration throughout the Magic Kingdom.

SUMULATION

INTRODUCTION AND OVERVIEW

This project aims at investigating effective crowd management techniques using a mobile application to influence crowd behavior. In order to test the effectiveness of this theory, a research team was formed to conduct this study. As part of this project, data and analysis were derived from various sources. Through the simulation, guest behavior was constantly influenced by character attraction placement for the simulation map. The simulation used a real-time map to represent the simulated areas of people in the park. This visualization is an effective way to analyze which areas of the park are overcrowded and which areas could help ease crowding issues by influencing pedestrian movement to less crowded areas of the park. Using the heat map, the character attractor was placed outside busy areas of the park to encourage movement towards less crowded areas.

RESULTS AND FINDINGS

The results of the simulation found that the character attractor influenced 60% of crowd behavior and successfully acted as a crowd mitigation tool. As seen in the graph below, crowd movement to less crowded areas of the park. Using the heat map, the character attractor was placed outside busy areas of the park to encourage movement towards less crowded areas.

ACKNOWLEDGEMENTS

Given that this work was done by the master of Digital Media at York University, the study was conducted on Anylogic Simulation system to measure how Disney characters can act as a crowd management tool to influence crowd movements throughout the Magic Kingdom. Using data to represent park entrance rates, attraction duration, and wait times, the study was able to capture the level of influence Disney characters had on park guest movements throughout their visit. This simulation reveals that Disney characters have the ability to influence crowd behavior with a probability rate of 30%. This data supports the view that the proposed mobile app will act as an effective crowd management tool and can strategically influence crowd migration throughout the Magic Kingdom.

GROWTH AND IMAGINATION

Disney is continuously looking at ways to engage their guests and improve their overall experience. While Disney2Go can act as Disney’s primary crowd mitigation tool, engaging guests and improving their overall experience is Disney’s primary objective. As Walt Disney said, "Disney will never be completed. It will continue to grow as long as there is imagination left in the world." The magic and fantasy elements of Disney will continuously evolve as technology advances and imaginations soar. This app upholds and respects Disney’s main objectives in the world. "The magic and fantasy elements of Disney will continuously evolve as technology advances and imaginations soar. This app upholds and respects Disney’s main objectives in the world."