

Playgrounds for Serious Games in Smart Cities

ABSTRACT

One of the main challenges in smart cities is to improve or adapt the behavior of citizens for good actions that impact their overall quality of life. This workshop offers a set of presentations on how different playgrounds in urban physical or digital spaces can help to create a better city. Looking at different city dimensions, such as education, healthcare, cybersecurity, mobility, and economy, we present different examples and assets in the workshop to help cities become better living spaces by introducing serious games and possible playgrounds in Smart Cities.

KEYWORDS

Smart Cities, Game Dynamics, Serious Games, Playgrounds, Digital Twins, Complex Systems

INTRODUCTION

Smart Cities use technology as a vehicle of innovation to improve their services to all (Batty et al. 2012) citizens seeking to provide the best quality of life. Smart Cities are also related to the digital transformation of our society (José and Rodrigues 2024), where digital twins help us understand the correlation of variables in the different layers of data available since urban spaces and cities can be seen as complex systems (Harrison and Donnelly 2011). With the digital twins, other technologies closer to video games are used to understand cities better (Ferri, Thibault, and Veenkamp 2021). Besides, most citizens have smartphones to access the digital twin models and make better decisions about activities in the city based on the data they can access (Birtchnell et al. 2020). But what if those decisions drive good behavior of citizens to save water when scarcity of water reserves is detected, and that helps the city to have the resiliency to cover all population towards a water crisis? Or if, based on traffic data in real-time, citizens decide to shift exit or entry hours to reduce traffic in peak times? (Casquero et al. 2022). Moreover, the best way to drive a solution is not to set up complex technology but to persuade citizens to behave well toward the problem's solution as an emergent action (Latifi, Monfared, and Khojasteh 2022). This is where digital games play an important role in helping all citizens behave properly in emerging situations. They are a tool to help them use their smartphones to interact in different possible playgrounds in the city. Here is where this workshop takes place: Serious Games based on digital games with different playgrounds can help cities and citizens become smarter by helping to create emergent behaviors in citizens to tackle challenges affecting their quality of life. Presentations during this workshop are aimed to show, in different areas, how serious games can help Smart Cities provoke emergent behaviors with a positive impact on all citizens. Examples in mobility, healthcare, cybersecurity, education, environment, and business are among the different dimensions of cities.

DURATION AND PARTICIPANTS

We expect to have a minimum of 6 presentations (15 min each) and a maximum of 10, with an introduction and wrap-up sessions to cover the full program from 1.5 – 3 hours. The profile of participants is multidisciplinary, looking to provide feedback and experiences of implementation or analysis of serious games in physical and digital playgrounds. Technologies such as Augmented Virtual Reality exploiting the digital twins of cities are welcome. The participants' profiles are related to academics and Smart Cities and Serious Games practitioners. To submit a proposal to this workshop, don't hesitate to contact Dr. Victor M Larios at victor.larios@academicos.udg.mx.

WORKSHOP STRUCTURE

1. The introduction session will set up where we are in Serious Games, Playgrounds, and Smart Cities.
2. The first block is dedicated to examples in Serious Games in Healthcare, mobility, business,
3. The second block for User Experience uses serious games in smart cities and different strategies to engage the users using different playgrounds and senses (visual, audio, tactile, etc.).
4. The third block concerns technological challenges, cultural implications, public policies, and opportunities to create new, engaging, serious games for smart cities.
5. We conclude with a wrap-up session.

OBJECTIVES AND OUTCOMES

We expect to present a current panorama of opportunities for Serious Games among all the key technologies to help the development of cities. Based on that, we expect to have the following outcomes of this workshop.

1. Cover the current state of serious games in smart cities with different playgrounds.
2. Identify best practices and successful cases related to increasing the user experience.
3. Understanding the best technologies, public policies, and multidisciplinary efforts for affecting the development of serious games for Smart Cities
4. Support a multidisciplinary community to continue sharing experiences and studies in this field.

ORGANIZERS

Victor M Larios is a full professor at the University of Guadalajara and Director of the Smart Cities Innovation Center at the Department of Information Systems. He holds a Ph.D. and master's in computer science and an Engineering Degree in Electronics. He has been focused for more than 15 years on Smart Cities systems architectures, digital twins, data visualization, and serious games.

Rocio Maciel is a full professor at the University of Guadalajara and a researcher at the Smart Cities Innovation Center at the Department of Information Technologies. Dr. Rocio Maciel holds a Ph.D. in Education

Management, has more than 25 years working in technology projects, and holds a bachelor's degree in laws. She is focused on measuring the UX of technologies deployed in Smart Cities and empowering gender equity in technological projects.

Jesus R Beltran is a full professor at the University of Guadalajara and a researcher at the Smart Cities Innovation Center. He holds a PhD in bio-medics and is a master inventor. His research is focused on healthcare and, more specific in neurosciences.

Jose A. Orizaga is a full professor at the University of Guadalajara and a researcher at the Smart Cities Innovation Center. He holds a PhD in Information Technologies related to the efficient deployment of WiFi networks in Cities. His current research is focused on cybersecurity in Smart Cities.

Cesar O Mora is a full professor and the head of the Department of Business Management at the University of Guadalajara and a researcher at the Smart Cities Innovation Center. He holds a Ph.D. in Fiscal Studies with experience in public management. He is focused on the development of organizational management as well as the use of serious games to learn and simulate businesses and their development in cities.

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