

## PREFACE

### Games for Urban Sustainability

The issues related to the growth of the urban population are among the most important challenges of our time. The recurring question is why it is so important to address sustainability at city scale and our answer is quite simple: the bulk of non-renewable resource consumption occurs in cities and this implies they are the first place where the innovations which must guide us towards a new model of sustainable development, *i.e. the development that meets the needs of the present without compromising the ability of future generations to meet their own needs* [1], must be experimented.

The main issue is therefore to design and to plan cities so that all the processes that take place inside them become fully sustainable from a social, economic and environmental point of view, the so-called *Triple Sustainability* [2] and this issue poses an interesting research question:

*How is it possible to design more sustainable cities in an era of zero resources, rife social conflicts and unprecedented environmental issues?*

When researchers, practitioners and public authorities discuss about urban sustainability, the focus is often on how to bring new technologies to improve the habitat. The general attempt is to innovate, in many different ways, the city hardware. Nowadays the area of urban innovation is experiencing a boom in research attention, in particular considering the human nature. Researchers, private companies and public bodies are now drawing on lessons from the social sciences, trying to understand the behaviors that shape use of resources and how people can be persuaded to use, first of all, less resources. However, as Stephen Wendel pointed out in [3], people are reluctant to change their habits. We all rarely recognize that to improve the quality of our neighborhood / city / region / planet, and of our life, we need to change our behaviors and lifestyles; and even though we know it, we hardly start doing it. It's hard to believe in the "butterfly effect", *i.e.* that our routines impact the entire ecosystem, so every little change of our daily behaviors is perceived as unnecessary.

With the attempt to radically change this perception, behavior change researchers highlighted the use of gamification and urban games as an effective tool. The definition of play elaborated by Suits and Hurka in [4] really helps to make this connection clear: playing a game is the voluntary attempt to overcome unnecessary obstacles. The triggers of games (*e.g.* social motivation, intrinsic benefits and monetary rewards) seem to have the power to provide people the knowledge, to enhance relational skills and change their perception about unhealthy behaviors, turning "unnecessary" habit changes into necessary. Mihaly Csikszentmihalyi in [5], clearly shows that games help to define new enjoyable experiences, change citizens' unsustainable habits and educate them to new environmental and social friendly ones.

*In the last decade, all over the world, physical and virtual urban games are trying to demonstrate these assumptions, but is it working?*

With the aim of proving the effectiveness of these approaches, the guest editors are currently involved in MUV, a research and innovation action [6] that enables citizens to deliberately meet inclusive and sustainable values in a game experience while they are moving around the city during their daily life. The gamification in MUV is the application of game-design elements in the urban contexts for the purpose of fostering sustainable mobility choices. MUV is co-created with neighborhood communities. The involved people have directly contributed to the design of the MUV game and its dynamic to increase the sense of community, the sense of participation and the sense of ownership on the livability of their cities. *Mobility as a Sport* is the MUV game metaphor. It has been conceived to let the citizens have a

rewarding personal mobility experience; the same rewarding sensations the *Athletes* experience when they improve their performance in sport. The public authorities involved are *Trainers* of the *Athletes*; they propose always new challenges to *Athletes* to let help them improving themselves. The local businesses are the *Sponsors* of the *Athletes*. *Sponsors* reward the best *Athletes* and make them stand out from the crowd. By playing the MUV game, athletes are rewarded with a certain amount of points for every trip on foot, by bicycle, by public transportation and by car-pooling. The points allow athletes to compete and get finally rewarded. Every citizen, playing MUV trains and participate to always new challenges competing with other as a single athlete or in team. It is worth noting that the direct participation of citizens and public authorities enables a new kind of interaction, an open dialogue, between citizens and the decision makers that in turn paves the way for creating a sense of responsibility and ownership among the community and for co-designing mobility solutions and policies that satisfy the local needs. The people mobility data, recorded as side effect of participating in the game, enable this evidence-based approach. In comparison with other traditional approaches, MUV game transforms mobility data collection and public policies' participation in an open and enjoyable experience, lowering the costs of public authorities for such activities and allowing them to open up the decision-making process by engaging citizens and stakeholders in evidence-based co-design events. All in all, the adoption of the MUV game not only establishes new ways citizens can experience and contribute to a more sustainable urban mobility, but it triggers new public-private collaborations. More than 40 impacts indicators [7] are constantly monitored during the project to assess the triple sustainability of the MUV approach in 6 pilot cities in Europe: Amsterdam, Barcelona, Fundao, Ghent, Helsinki and Palermo.

We believe it is worth shedding the light on the adoption of urban games to design sustainable cities. Therefore, this focus session was designed to select the cutting-edge researches and results from real experiments of games for urban sustainability. It is envisioned as an attempt to disseminate results and exchange experiences among the research community. We have selected, among several contributions, four papers dealing with games for urban sustainability at large. The first contribution by Opromolla *et. all.* shows that the application of game principles to a Mobility-as-a-Service ecosystem is instrumental to improve the quality of interaction among citizens and the urban mobility services; this is indeed an important step to foster the adoption of sustainable urban mobility services and to reduce the negative externalities from the use of private cars. The second contribution by Marconi *et. all.* reports very interesting results achieved with Play&Go, an urban game that exploits gamification for promoting a positive change of mobility habits. Play&Go exploits a recommendation system that, for each player, produces a list of personalized challenges by considering the player's game history, habits and skills, aiming at keeping the user in a state of flow. The third contribution by Gizzi *et. all.* addresses an increasingly important issue in our society that is the waste management; the paper presents an interesting game to teach new generations (*i.e.* our kids) the value of protecting our environment by making the separate collection an enjoyable and rewarding experience for children. Finally, the fourth contribution by Davide Leone presents a set of approaches to design urban games to involve people in sustainable actions and obtain data on people habits in return to design and to plan a better urban future.

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