

# Location-Based Games and the Matter of Invention

Cleci Maraschin, Federal University of Rio Grande do Sul  
Renata Kroeff, Federal University of Rio Grande do Sul  
Fernando Teles, Federal University of Rio Grande do Sul  
Raquel Salcedo Gomes, Federal University of Rio Grande do Sul  
Poti Gavillon, Federal University of Rio Grande do Sul

**Abstract:** The matter of invention is important for learning processes once repetitive or cognitive actions lack flexibility before problems of varying magnitude, even though they may work well for the resolution of specific problems according to a given model. Location-based games may offer an interesting occasion for invention, for they demand coordinations between territory and game. In other words, it is necessary to match two different dimensions, which is a characteristic of invention according to Simondon (2013).

## Introduction

This paper is meant to present the first analyzes of the invention made possible by the game named “A Day in the Botanical Garden”. This game was developed to be used as a research and intervention instrument in a partnership between *UFRGS* (Federal University of Rio Grande do Sul) and Porto Alegre’s Botanical Garden, which is part of the institution *Fundação Zoobotânica do Estado do Rio Grande do Sul* (Zoo-Botanical Foundation of the State of Rio Grande do Sul). It is a location-based game, made with ARIS platform, in which players are invited to go around the garden to locate and plant virtual seeds for the preservation of the Botanical Garden’s living collections. In order to accomplish these goals, players must walk around the garden as they use their tablets to find the seeds and the necessary tools for planting them, such as a watering can, water, and a shovel, which are hidden around as virtual items. Along the way, there are other agents (non-playable characters) that might help the player as s/he seeks to complete the main goals or that will make the game more challenging. In the game the player chooses to see a map or satellite image of the place. The screen shows images of things or characters in specific places and a dot where the player is. When physically close to the place of one of those, the game shows that there is something nearby and the player can choose to interact with it, going into a conversation screen with multiple options that may give or take items from the player’s inventory and may award points. The gameplay is mainly based on the interactions with the Botanical Garden (and choice of trajectories) through the map and the choices on conversations. Those choices are centered on choosing what items to collect, to lose or trading them for points, and the places where the player decides to go change the amount of points awarded. The idea of matching a ludic, interactive and technological element to the Botanical Garden’s already scientifically and educationally meaningful environment comes from the fact that games have two major dimensions: they consist of (1) real rules with which players interact with and of (2) a fictional narrative.

## Inventive Trajectories

In order to play the game, players must produce a compatibility/match between their own move throughout the garden along with the representation of such move on the map showed on the iPad. This achievement may be considered as an invention, for anticipation and prediction are not enough for resolving the challenges. Therefore, anticipations have to be continuously compared to the current situation, which will require players to rectify or change their trajectory followed at a given occasion according to a goal. Invention is more than problem solving, it is about creating new and complex ways of interacting with the world (in this case, with a game).

During the year 2014, we conducted workshops with students for testing out the game’s second version. In total, 12 workshops were carried out with students of 4th and 5th grades from a public school situated nearby the Botanical Garden (Kroeff, 2014). On this poster we present and discuss the trajectories followed by pairs of students who participated in the first game quest: finding the gardener (Kroeff, 2014). The colored lines (Image 1) present a sample of the results collected, by showing the trajectories followed by three of those pairs. By only considering each pair’s resolution speed of the problem, it is possible to establish an order of actions: first the red; second, the green and third the yellow pathways. However, in terms of invention, it is interesting to analyze different trajectories, as the problem was only solved by resorting to mediations not readily available within the participants’ action schemes, which would eventually lead to invention.

## Initial Analysis



**Image 1:** Paths taken by the pairs in order to find the Gardener

The different trajectories taken by the players made it possible to observe their search for distinguished mediators as they produced a compatibility between both action domains (territory and game). On one hand, one pairs of players would resort to the semiotic system available in the Botanical Garden itself, such as the reading of signposts, maps and icons. Another pair, on the other hand, preferred to address the Garden staff or the visitors, yet another one chose to establish a coordination of actions between themselves, by distributing tasks and producing trial and error analysis. Such difference between the action modes revealed distinct mediation levels. Mediation may consist in a mere change in the operating model adopted—as it was the case for the pair of players who distributed tasks between them—or it can assemble an intermediate object whose choice and use may require a cognitive turn.

The problem may be solved when communication is established between game and territory. Our analysis suggests that invention, besides making it possible for the resolution of a problem, gives rise to the experience of cognitive reversibility; a feedback that starts with the full resolution, by moving through the organization of the means needed for the decision making about the actions according to the compatibility mode followed by each pair in their choice for mediations.

## References

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- Simondon, G. (2013). Imaginação e invenção. Buenos Aires: Cactus