

Characterizing player types in gamified geodata acquisition - An exploratory analysis of StreetComplete

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Volunteered Geographic Information (VGI) projects like OpenStreetMap (OSM) have recently gained wide interest also beyond specialist communities. Studies have shown, however, that the average OSM contributor is middle class or higher, typically middle age, and to a certain degree educated [1]. The concept of gamification is one way to widen and diversify user engagement in VGI projects. It allows making otherwise unattractive activities more compelling by using game design elements. The work presented addresses the use of gamification in the context of geodata collection.

The location-based Android application StreetComplete allows collecting attribute information for existing OSM features. A map view thereby indicates missing data in the vicinity of the players' current GPS positions, including names, speed limits, opening hours or roof shapes. Users collect this information on site by responding to questions, thus combining the less attractive task of data acquisition with playful geographic exploration. The main game design element used in this application is a scoring system that allows users to achieve points, and thus to compete with each other. It is the nexus between this scoring system with spatial and temporal parameters of gaming behaviours this work focuses on.

The main research question of this work is based on two assumptions. We assume that users are at least subconsciously aware that they are participating in a playful, competitive data collection; and we assume that certain parameters of users' gaming behaviour partly reflect their intention to succeed in the game. The latter is based on the first law of geography [2], and it implies assuming players to implicitly or explicitly employ "spatial strategies" based on scores obtained so far to determine which quest they shall solve next. Based on these assumptions, we address the following research question: To what extent is it possible to distinguish player types from the spatiotemporal parameters of their gaming behaviours?

The study presented uses a modified version of StreetComplete. A total of 40 test persons took part voluntarily, 28 of which were geography students at Heidelberg University.

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All test persons started the game from the same point and could independently explore a playing field located in Heidelberg. Location and extent of the study area were chosen to reflect realistic conditions with respect to OSM task variety and density, as real quests from the game were used. All GPS tracks were recorded, and then used to derive spatial and temporal parameters, such as game duration, distance travelled and average movement speed. The area of the standard deviation ellipse of each user's GPS positions further proxies the extent of their area covered, whereas the elongations of these ellipses are used as proxies for the target orientations of the users' movements. Another parameter calculated is a detour factor, given as the ratio between the actual and the "ideal" path length, the latter being the shortest path calculated using the OpenRouteService API.

Using cluster and archetype analysis, we can identify two general sorts of players: one group that shows interest in good performance concerning the scoring system, and a second group of players that seems more attracted by exploring the playing field. These results are in line with the widely regarded player classification scheme proposed for non-spatial settings where the two groups identified have been named "Achievers" and "Explorers" [3]. In addition, we were able to identify three novel player types: players who optimise for time ("grasshoppers"), players maximizing their number of tasks solved, regardless of point scoring ("grazers"), and those trying to integrate data collection efficiently with other trips ("en passant collectors"). These novel types of players are spatial and temporal in nature, indicating that geographic space is an important factor when it comes to characterising gamification, likely also beyond OSM. We thus expect the exploratory results presented to be of broad interest also to psychologists, cognitive, and social scientists, especially in view of the recent increase in interest these disciplines have shown in the use of geographical information and location-based techniques [4]. The identified player types can further be used practically to personalize StreetComplete and to advance the integration of further game elements.

References

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