

Mini-map design as a cartographic element of the user interface - based on video games

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Abstract:

Video games contain many geographical, psychological, cognitive and cartographic aspects. Being an incredibly complex technological system, many games rely on real world concepts to construct their virtual world. This is represented by a virtual geographical space that represents a series of phenomena and behaviours linked by detailed spatial information (Wolf 2002). The topic of cartography in games is discussed in scientific research in connection with the design of cartographic products, game production, but also with aspects of gamification (Horbiński & Zagata 2022). The main aim of the study was to identify the design features of a mini-map as a navigation aid in virtual geographical space in video games. A mini-map is an element of the user interface that is responsible in particular for topographical orientation (comparison of the space with a map) in virtual geographical space (Figure 1).



Figure 1. Examples of video games with a mini-map in the user interface (A) Red Dead Redemption 2; (B) Guild Wars 2.

A mini-map is usually referred to as a "radar screen" or "corner map", representing a miniature version of the game world (Edler & et al. 2018) or part of it from a top-down perspective (in 3D games) or sometimes from a side view (in 2D games). In cartography, the most important equivalent of a mini-map is the inset map (locator map). This element of the user interface is a kind of navigational aid, as it usually represents a larger space than the area visible to the player's camera, but also provides detailed information about position, orientation, nearby objects and the terrain around the player (Zagata & et al. 2021). The mini-map itself provides important information that allows the user to make the right decisions during the game and plays an important role in navigation in various game genres (RPG, MMORPG, Battle Royale, RTS, Racing, Survival). The 100 most popular video games featuring the mini-map were selected with the help of internet portals that collect information on popularity rankings and ratings from users and video game critics. Based on comparative analysis, classification and selection of cartographic material, comparison of specific parameters for selected design features and application of cartographic design principles, the study identified eight design features of mini-maps and their popular parameters and attributes in video games: Shape (circle, irregular, rectangle, diamond, parallelogram, square and ellipse), Position (top left, top right, bottom left, bottom centre, bottom right), Orientation (camera view, north view, static), Centring (player-centred, world-centred), Projection (orthographic, perspective), Base layers (artificial, transparent, in-game), Proportions (0–1%, 1.1–2%, 2.1–3%, 3.1–4%, 4.1–5%, 5.1–6%, 6.1–10%), Additional navigational elements (chessboard, compass, directional cues, peripheral arrows, text and north arrow). The study found that only 1 game met all the conditions for popularity of analysing the occurrence of individual mini-map features (Assassin's Creed IV: Black Flag): Projection: orthographic; Centring: player-centred; Base layers: artificial; Shape: circle; Orientation: camera view; Position: bottom left; Proportions: 2.1–3%; Additional navigational element: north arrow (Figure 2).

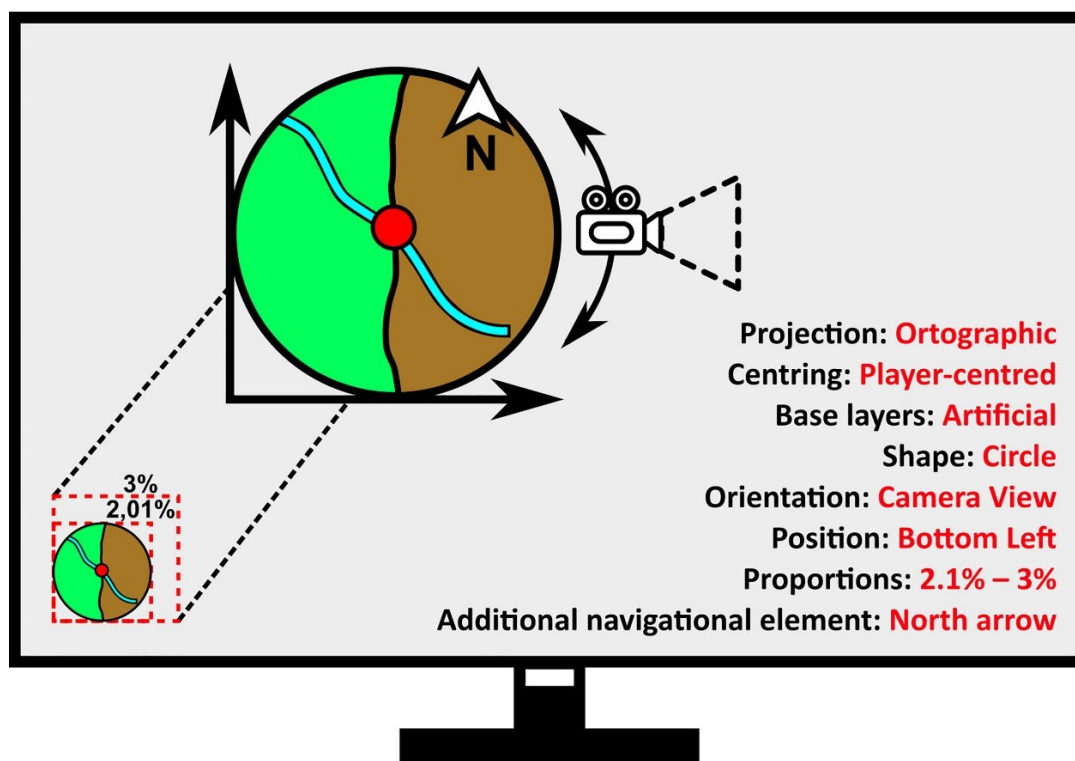


Figure 2. Mini-map composition on the display view (16:9) with the most popular parameters of 8 design features—by separate analysis for each parameter.

The only significant divergence from the principles of map design is the use of a circle shape instead of the traditional rectangle. However, this discrepancy is related to the peculiarities of navigation in virtual geographic space resulting from the necessary adaptation of cartographic design to the new geomeia. As part of this study, key attributes for the design of mini-maps were identified that, when considered separately, complementarily and potentially holistically, confirm the feasibility of designing a mini-map according to traditional cartographic design principles. The identified mini-map parameters can be useful not only for the design of the cartographic interface of the game, but also for other geomeia products (Medyńska-Gulij 2021).

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