Título: **Balancing and Transposition of Maps for Location-based Games**

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Resumo:

Location-Based games (LBGs) rely on the location of players to change its game state, usually as the main trait of playability. However, developing worldwide LBGs is a challenging task due to the Salvar need to deploy game instances in multiple locations, while maintaining the same game balancing, features, and even correlations between locations of the game and the real world. Since LBGs rely on players' location, it is virtually impossible to manually design interactions, challenges, and game scenarios for each place a player is at. Therefore, the same LBG is likely to have distinct instances with varying difficulty levels because of differences in terrain, distance, transport availability, etc. As a result, even established game companies struggle to deploy LBGs around the globe, so the current generation of LBGs are not available in many areas, especially small cities and poor neighborhoods of big cities. Additionally, modern LBGs still present huge balancing differences between regions, and avoid exploring competition between players like other game genres. In this thesis, we propose a method for transposing maps of LBGs while focusing on maintaining game balancing. This approach depends on information about Points-of-Interest (POIs) around the players' location and estimations about

the cost to move between POIs. We introduced two measurements to estimate game balancing in modern LBGs and implemented three different algorithms that aim at transposing LBGs' maps with minimal variations in game balancing. In this case, we propose to convert LBGs into directed weighted graphs and use one of the algorithms to generate an LBG instance according to the player's location. To validate the proposed approach, we designed four LBGs with distinct features, gameplay and mechanics, and conducted an experiment that required samples to compare maps generated by these algorithms in different locations. Results indicate that games with similar game balancing score higher and that algorithms differ in performance depending on the number of POIs. Finally, we can conclude that this work contributes to improve the development of LBGs by helping to mitigate the challenge of transposing LBGs while maintaining game balancing.

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