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Investigating rendering speed and download rate of three-dimension (3D) mobile map intended for navigation aid using genetic algorithm (Conference Paper)

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Abstract

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Prior studies have shown that rendering 3D map dataset in mobile device in a wireless network depends on the download speed. Crucial to that is the mobile device computing resource capabilities. Now it has become possible with a wireless network to render large and detailed 3D map of cities in mobile devices at interactive rates of over 30 frame rate per second (fps). The information in 3D map is generally limited and lack interaction when it's not rendered at interactive rate; on the other hand, with high download rate 3D map is able to produce a realistic scene for navigation aid. Unfortunately, in most mobile navigation aid that uses a 3D map over a wireless network could not serve the needs of interaction, because it suffers from low rendering speed. This paper investigates the trade-off between rendering speed and download rate of the 3D mobile map using genetic algorithm (GA). The reason of using GA is because it takes larger problem space than other algorithms for optimization, which is well suited for establishing fast 3D map rendering speed on-the-fly to the mobile device that requires useful solutions for optimization. Regardless of mobile device's computing resources, our finding from GA suggest that download rate and rendering speed are mutually exclusive. Thus, manipulated static aerial photo-realistic images instead of 3D map are well-suited for navigation aid. © Springer International Publishing Switzerland 2014.

Author keywords

3D dataset Download rate Genetic algorithm Rendering speed

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