

A REAL-TIME MOBILE AUGMENTED-REALITY SYSTEM FOR STREET-AREA EXPLORATION BY COMPUTER VISION TECHNIQUES USING SMART GLASSES

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Abstract

A new real-time augmented reality (AR) tour guidance system using smart glasses for outdoor street-area exploration is proposed, which is based on image matching using speeded up robust features (SURFs). Novel methods or techniques have been proposed for the system to perform the following functions: (1) learning a street-area environment before a tour guidance is started; (2) computing the accurate positions and orientations of a touring user; (3) updating the latest user position and orientation in realtime; (4) planning a shortest path to guide the user by updating dynamically an AR guidance arrow shown on the display of a pair of smart glasses worn by the user; (5) displaying information about along-path buildings on the screen of the smart glasses in an AR manner. Good experimental results show the feasibility of the proposed methods and system for practical realtime applications.

Keywords: tour guidance system, augmented reality (AR), speeded up robust features (SURFs), smart glasses, image matching.