ABSTRACT

Master dissertation: 66 pp., 18 fig., 1 tab., 1 app., 14 sources.

The relevance. Augmented Reality (AR) is a common reality in which digital graphics are added. Unlike virtual reality, which requires full immersion in the virtual environment, the added reality uses the environment around us and simply overlays some of the virtual information, such as graphics, text, 3D models and interaction with them, over its image. This information is used as an additional useful tool that provides assistance in everyday reality.

Today, you can watch the beginning of a new wave of augmented reality that captures mobile phones and applications. It is used in games, navigation, education, production processes, travel, and so on. A few years ago, this was not possible, as the processors in the phones were not powerful enough to handle the required amount of information, and the cameras could only shoot at relatively low quality.

Several libraries have been developed to create mobile applications with the added reality. They cover the various needs of developers and have certain features. But most of their methods have a common purpose: the recognition of target images and objects in the environment, the formation, positioning and display of the objects of the augmented reality. Therefore, the analysis of methods for solving these problems, their improvement and optimization is a task, worthy of attention and research. Thus, it is possible to accelerate the development of high-quality mobile applications with augmented reality.

The purpose of the research is to investigate existing approaches and methods of forming the supplemented reality and to develop an improved model for constructing an augmented reality with the simultaneous tracking of the location in the environment.

Objectives of the search. To achieve the goal, we must complete the following tasks:

– analyze modern methods and approaches for the formation of augmented reality;

– develop a model for augmented reality with simultaneous tracking of the location;

– develop an experimental mobile application for the formation of an augmented reality using the developed model;

– do an experimental study of the developed model.

The object of study is a process of creating of augmented reality and orientation in the environment.

The subject of the research is the speed and efficiency of the methods of formation of augmented reality and orientation in the environment.

Relationship with scientific programs, plans and themes. The work was carried out at the Department of Automated Systems for Information Processing and Management of the National Technical University of Ukraine "Kyiv Polytechnic Institute. Igor Sikorsky "within the framework of the theme" Methods and Technologies for High-Performance Computing and Processing of Large Data Sources ". State registration number is 0117U000924.

The scientific novelty of the results is to apply an algorithm of simultaneous localization and mapping in the process of constructing an augmented reality for more stable work.

The practical meaning of the results consists in an improved algorithm for constructing an augmented reality that can be applied in the development of mobile software.

Publication. Work results are published in conference abstracts of XIV International scientific conference ISDMCI’2018 «Intellectual Systems for Decision Making and Problems of Computational Intelligence» and a conference «Informatics and computing machines-ICT-2018».

AUGMENTED REALITY, ORIENTAION IN ENVIRONMENT, SLAM, MOBILE TECHNOLOGIES