

ABSTRACT

Master's thesis: 105 pages, 48 figures, 7 tables, 4 appendixes, 22 references.

Relevance.

Virtual reality technologies can be used in many areas: for future professionals training, for the preliminary review of a new product, for the virtual layout of buildings without creation of physical mock-ups. However, at the moment, this technology is still quite new and requires the completion of many elements. One of the most important of these elements is the speed of three-dimensional virtual reality scene visualization, the main part of which is lighting simulation in the virtual space.

Purpose and objectives of the study.

The purpose of the master's thesis is to develop a software for lighting simulation in virtual reality. To achieve the goal next tasks were identified, which are addressed in the work:

- a) review the existing lighting simulation methods in a three-dimensional virtual environment;
- b) develop lighting simulation software;
- c) conduct testing of the created software for checking the use of resources by the developed approach;
- d) based on the test results, analyze and adjust the chosen method to optimize the use of resources by software.

Object of study.

The object of the study is the speed of the mechanisms for graphical information visualization, which is formed using lighting simulation methods.

Subject of research.

The subject of the study is the method of lighting modeling based on procedural texturing.

Methods.

Research methods are lighting simulation methods in virtual reality, experimental verification of the lighting model in virtual reality, measuring the use of resources by the mechanisms of graphical information visualization.

Scientific novelty of research.

Scientific novelty is determined by the following theoretical and practical results:

- a) a new method of lighting modeling was created based on procedural texturing;
- b) new software has been developed to perform preliminary modeling of illumination and basic real-time lighting modeling, which is based on the use of procedural texturing of lighting maps.

Publications

- Шматов Я.Р. «Модель освітлення у віртуальній реальності, що базується на технології процедурних текстур», ІХ Міжнародна науково-практична інтернет-конференція «Весняні наукові читання»;
- Шматов Я.Р. «Процедурний підхід до моделювання освітлення у віртуальній реальності», ІІ Міжнародна науково-практична конференція «Актуальні наукові проблеми. Розгляд, рішення, практика».