A Web Application

for an Interior-Design Simulator using Augmented Reality

Tomoki Tanaka[1]

Graduate Student,

Graduate School of

Engineering

Chiba University

Takuma Nakabayashi[2]

Graduate Student,

Graduate School of

Engineering

Chiba University

Keita Kado[3]

JSPS Research Fellow,

Building Department National Institute

for Land and Infrastructure

Management

Gakuhito Hirasawa[4]

Associate Professor,

Graduate School of

Engineering

Chiba University

ABSTRACT

We describe an interior-design simulator implemented as an augmented reality (AR) web application. The system is freely available over the internet and open for use by anonymous users. The purpose of this research is to evaluate the effectiveness of the AR system in the architectural field; therefore in the near future we plan to interview users.

KEYWORDS: Augmented Reality, Interior Design Simulator, Web Application.

1 INTRODUCTION

As described in the paper by TAMURA[1], it is difficult to evaluate the practicality of AR systems where various factors complicate the evaluation. The gap, jitter and occlusion of overlapping 3D graphical representations on a back-plate image are typical factors. Completeness of a virtual 3D model, reproducibility of light environments, and video frame rates can also be factors. Which of these factors is important depends on the particular evaluator.

After considering practicalities in evaluating AR systems, we noticed that third-person evaluations offer reasonable solutions. We developed the AR system as a web application and made it available to a large number of anonymous evaluators. Interviews have as yet to be performed but will be attempted soon.

2 SYSTEM ARCHITECTURE AND IMPLEMENTATION

The system is composed of client and server programs written in PHP and C/C++ languages. Dynamic HTML programs reside on the server; the client loads and executes the HTML including Java Scripts if necessary. The maker-tracking program in C/C++ resides also on the server and calculates the camera and model space parameters of a digital image when uploaded to the server.

2.1 Marker Tracking

The maker-tracking program employs ARToolkitPlus. If tracking is successful, the output data is stored in the PostgreSQL database. The server retrieves the data from the database when requested by a client.

[1] email: TANAKA_Tomoki@graduate.chiba-u.jp
[2] email: takuma_nakabayashi@chiba-u.jp
[3] email: keita_kado@graduate.chiba-u.jp
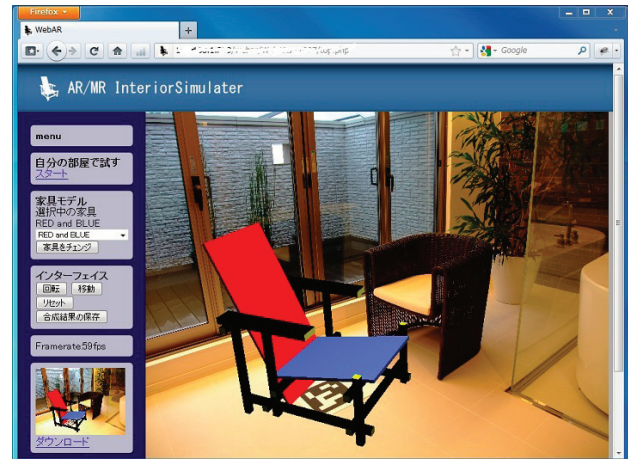[4] email: hirasawa@faculty.chiba-u.jp

Figure 1. Augmented Reality on a Web Browser

2.2 Superimposing

The client superimposes a 3D model of the item of furniture on the digital image recovered from the server's database. The HTML file includes WebGL descriptions controlled by JavaScript code running in a web browser.

2.3 Furniture Model

We adopted Blender as our 3D modeler to create representations of furniture items because the exporter of an x3d file is provided by default. The parser that we developed in C/C++ reads the x3d file and outputs modeling data of geometry and appearance as a JavaScript code.

3 CONCLUSION

We described the development of an AR system as a web application. In the near future, with improvements made, we will conduct an open experiment involving users of the system as anonymous respondents to a survey. Through this experiment, we will analyze the practicality in evaluating an AR system.

REFERENCES

[1] Hideyuki Tamura, Hirokazu Kato, The TrakMark Working Group: "Proposal of International Voluntary Activities on Establishing Benchmark Test Schemes for AR/MR Geometric Registration and Tracking Methods". Proceedings on International Symposium on Mixed and Augmented Reality (ISMAR2009), October 2009.