

WebGL on Mobile Devices

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Abstract—The abstract goes here, e.g. <http://www.phdcomics.com/comics/archive.php?comid=1121>.

Index Terms—WebGL, mobile computing, teleseminar.



1 INTRODUCTION

The technologies which allow people to interact with the world around them evolve constantly. Whereas it was common to simply display information in a static form in the early days of the web, at present an ever increasing amount of content is presented in dynamic and interactive ways.

In the effort to expand internet browser functionality to natively support three-dimensional graphics, HTML5, WebGL have been developed. Many web sites already offer functionalities which were previously only found in native applications, e.g. word processing using Google Docs [1] or creating presentation using 280 Slides [2], thus narrowing “the gap between them” [3]. A native usage of 3d-functionality enhances these “web applications” even further.

“Augmented Reality (AR) has been defined broadly as combining real and computer-generated digital information into the users view of the physical and interactive real world in such a way that they appear as one environ-

ment, thus providing a bridge between digital information and the physical world” ([4], [5], [6], [7] via [8]). Application areas of AR can be as broad as ranging from health care [9] to education [10] to tourism [11]. The topic has gained momentum thanks to the rise in smartphone usage. “To make the world itself the user interface [...] may revolutionize the way information is accessed and presented to people in the future [4], [7].

The rise of smartphones is growing with a fast and still accelerating pace, enabled ways of displaying information in a new way in a truly mobile context to many people [12], [13]. They offer a much higher power than feature phones and even claim to offer the “real web” experience with “real browsers” [14]. There are differences, however, between the way information can be accessed from a desktop system and a mobile device, influenced by factors like screen size, processing power, and input methods.

3d-support on mobile devices is still in an early phase. Adobe abandoned Flash in late 2011 [15], leaving WebGL as the main (method) of providing interactive 3d content on the mobile web, even if it is still in an initial phase.

This paper analyzes the status quo and potentials of WebGL on mobile devices (regarding performance and human-computer-interaction.)

The paper is structured as follows: Chapter 2 gives background information on relevant topics, i.e. augmented reality, WebGL, and

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human-computer-interaction (HCI) with mobile devices and their evaluation criteria; Chapter 3 gives implementation details of the the WebGL environment used to capture the status quo; Chapter 4 presents the evaluation as well as limitations to this study; and Chapter 5 gives a summary of the results and presents future research opportunities.

2 BACKGROUND

2.1 WebGL

2.1.1 Design

2.1.2 Mobile WebGL

2.1.3 Status Quo

2.1.4 Evaluation criteria

2.2 Augmented Reality

2.2.1 History

2.2.2 Categories

2.2.3 Native apps and web applications

2.2.4 WebGL usage

2.2.5 Evaluation criteria

2.3 UI and UX Research

3 IMPLEMENTATION

<http://www.phdcomics.com/comics/archive.php?comid=1476>.

4 EVALUATION

5 CONCLUSION

The conclusion goes here.

APPENDIX A

Appendix one text goes here.

APPENDIX B

Appendix two text goes here.

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Listing 1: Hello World Code Snippet

```
System.out.println("Hello World!");
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