HIGH-LEVEL AUTHORING TOOLS IN AUGMENTED REALITY: ANALYSIS AND CASE STUDY

STUDENT: ROBERTA MOTA
SUPERVISOR: VERONICA TEICHRIEB
CO-SUPERVISOR: RAFAEL ROBERTO

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1. CONTEXT

The increasing advances of both hardware and software have been allowing for richer experiences in augmented reality (AR). For instance, the creation of mobile devices with stronger processing power, graphic resources, and a mix of sensors have made possible the diffusion of applications for mobile AR. Also, recent improvements in tracking and visualization techniques have enabled the creation of applications that combine information from multiple sources, such as camera, compass, gyroscope and GPS, to display AR contents based on those wellspring, such as geo-location applications (Langlotz, Mooslechner, Zollman, Degendorfer, Reitmayr, & Schmalstieg, 2012). As a result of these recent developments, AR has been applied in several domain areas, including advertising, medicine, education, robotics, entertainment, tourism, and others (Bower, Howe, McCredie, Robinson, & Grover, 2013).

The increasing group of application domains resulted in the adoption of AR by the general public, thus including marketers, designers, doctors, teachers, game and web developers. Hence, there has been a gradual demand for tools that can facilitate the development of AR applications in the sense of making this technology accessible to this diverse audience (Coleman, 2012). In this context, AR authoring tools comprise a wide range of software products with capabilities for composing, editing, and managing AR experiences.

AR authoring tools can be classified according to their programming characteristics and content design from low to high-level approaches. Therefore, distinctive authoring approaches have different concept abstractions and interface complexity - and hence address audiences that do not necessarily have the same technical expertise (Hampshire, Seichter,

Grasset, & Billinghurst, 2006). Still, it is important to observe that authoring approaches are constructed hierarchically: abstraction is added gradually, while low-level features and concepts are hidden.

Among the approaches of AR authoring tools, it is important to note the relevance of those categorized as high-level. They remove the dependency of knowing a programming language, replacing it for graphical user interfaces to describe the virtual content and its relationship with the real scene. These high-level tools are particularly relevant because they are crucial to the widespread adoption of AR since they allow the development of applications and content by ordinary users, which have expertise in the application area.

2. Purpose

This work aims at analyzing high-level AR authoring tools in both commercial and academic realms. First, the analysis will examine the architecture of such tools, besides understanding the dataflow of development and access to the AR content. Following, the different tools will be classified according to their architectures, besides identifying both benefits and limitations of each of these models.

The two steps previously mentioned will allow the creation of a case study, in which a high-level AR authoring tool will be developed to suit one of the previously established architecture models.

Finally, users with no technical expertise will test the tool with the purpose of examining if it indeed facilitates the development of AR content.

3. SCHEDULE

TASKS	JUL				AUG				SEP				OCT				NOV			
Bibliography review	■	■	■	■																
Analysis of AR authoring tools		■	■	■	■															
Development of the authoring tool						■	■	■	■	■	■	■	■	■	■					
Elaboration of tests and user evaluation															■	■				
Preparation of report and monograph defense											■	■	■	■	■	■	■	■	■	■

4. REFERENCES

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5. POTENTIAL SUPERVISORY COMMITTEE

Geber Lisboa Ramalho

6. SIGNATURES

Veronica Teichrieb

Supervisor

Rafael Alves Roberto

Co-Supervisor

Roberta Cabral Mota

Student