System porting to mobile devices at the example of the SEE project

Master Thesis

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ABSTRACT

TODO: Hier das Abstract der Arbeit. Kann deaktiviert werden.

ERKLÄRUNG

Ich versichere, diese Arbeit — sofern dies nicht explizit anders gekennzeichnet wurde — ohne fremde Hilfe angefertigt zu haben. Ich habe keine anderen als die angegebenen Quellen und Hilfsmittel benutzt. Alle Stellen, die wörtlich oder sinngemäß aus Veröffentlichungen entnommen sind, sind als solche kenntlich gemacht.

Bremen, den May 5, 2022

Roman Gressler

DANKSAGUNG

TODO: Danksagung hier.

CONTENTS

1 CONCEPT

In this section a concept of a mobile "*Software Engineering Experience* (SEE)" version will be presented. Therefore, a prototype will be created to point out the features that a mobile version of "SEE" requires.

Prototypes are a common way to express the needs of a system. It is a low-cost way of planning an implementation, that can highlight challenges regarding constraints of a system early on.

Even though a prototype will never be able to show every aspect and need of a complex system, it should still help to answering questions like: How should the system feel? How should it be implemented and what are the key features? Houde and Hill (1997)

"SEE" is meant to be used by multiple platforms such as desktop devices, mobile devices and virtual reality devices. Each device has different interaction constrains. While a desktop user will control the player with mouse and keyboard a mobile user will interact with virtual joysticks on a touchscreen. Selecting nodes of a "*Code-City*" will be done by clicking it with a mouse on desktop devices, while a mobile device will require a touch input.

SEE: *Eine interaktive Visualisierung von Software, welche die* Code-City- *Metapher verwendet und einen kollaborativen Multiplayer über verschiedene Plattformen*[2] *hinweg ermöglicht.*

Code-City: *In der Code-City-Metapher werden Softwarekomponenten durch Gebäude in einer Stadt repräsentiert, wobei die Eigenschaften dieser Gebäude verschiedene Metriken der Software ausdrücken können — z. B. könnte die Höhe eines Gebäudes der Anzahl der Codezeilen entsprechen.*

1.1 INTERFACE

In the following a paper prototype will be presented that marks out a concept for the mobile interface. Since the field of mobile development is quite young there few guidelines regarding the design of mobile device interfaces. A guideline that is widely accepted is problematic to find. Renaud and Van Biljon (2017), Punchoojit and Hongwarittorrn (2017)

Major differences to desktop environments are the screen size, forms of input and input feedback. To assure as much space is used for the actual interaction of the app the menu should just take as much space as needed. As a study has found out, a size of at least 8*8 mm is needed to reduce error rates selecting the right button. Conradi et al. (2015)

Adipat and Zhang (2005)

Moving the player will be handled with virtual joysticks. The left joystick will move the player through the virtual room and the right will move the camera angle or in other word the direction the player looks at. The joysticks are placed in the left and right corner and should just take as much space as needed to be handled comfortably. This way

the player is able to navigate through the virtual room with his/her thumps while still having enough space to work on the "Code-City".

Figure 1.1: Joysticks for moving in "SEE"

Figure 1.2: Quickbar for various interactions in "SEE"

1.2 INTERACTION

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1.3 REQUIREMENTS

In the following a list of requirements will be given, which will specify in detail what the implementation of a mobile version has to take care of. The list will be referred to multiple times in the upcoming realization part in chapter 2. Requirements are essential for the planning phase as they give a good fundamental structure for the developer to rely on. Robertson and Robertson (2012); Stevens and Pooley (2005)

Figure 1.3: Selection mode in "SEE"

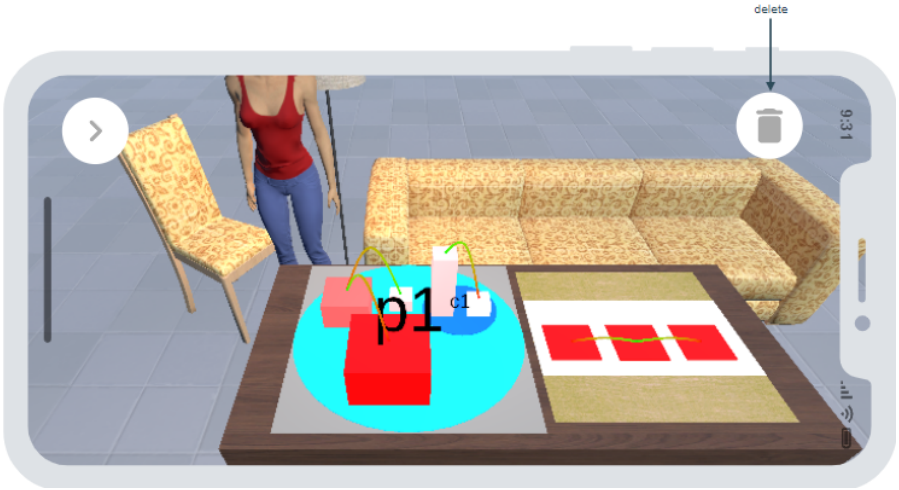

Figure 1.4: Delete mode in "SEE"

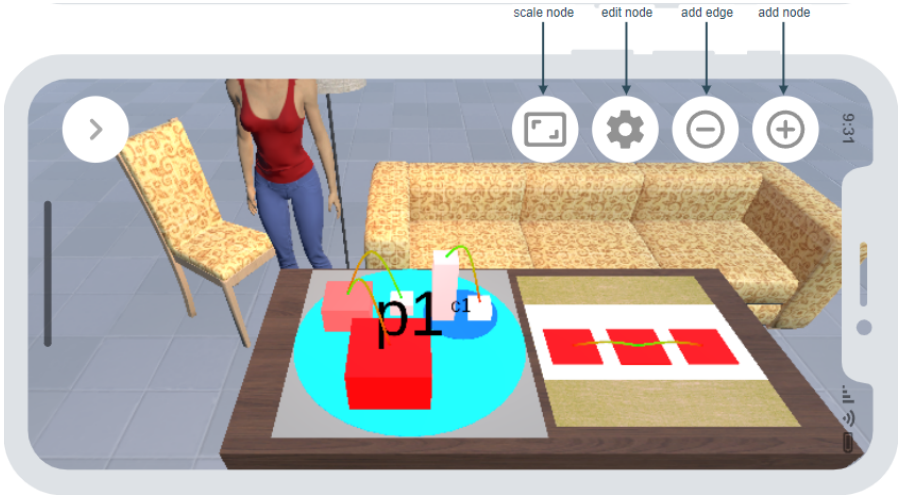

Figure 1.5: Node interactions in "SEE"

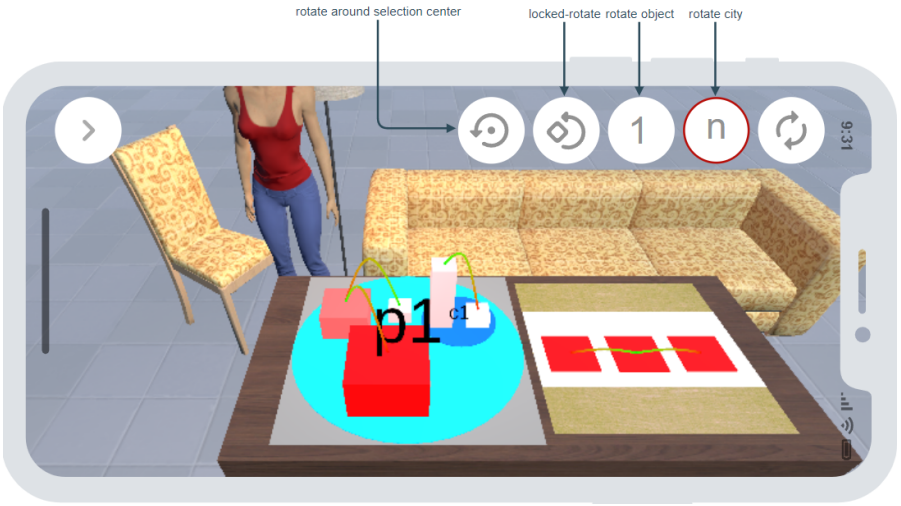

Figure 1.6: Rotation mode in "SEE"

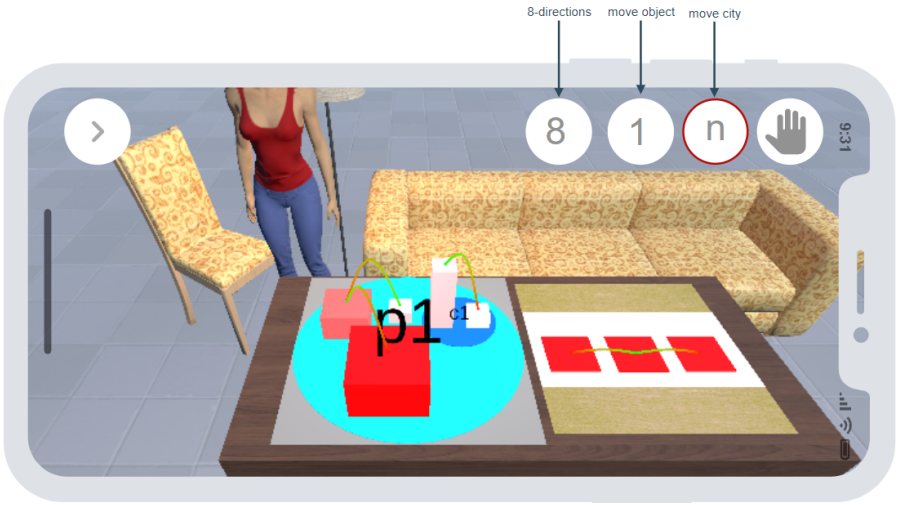

Figure 1.7: Movement mode in "SEE"

2 IMPLEMENTATION

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3 CONCLUSION

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3.1 OUTLOOK

AR - Santos et al. (2016)

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GLOSSARY

Code-City In der Code-City-Metapher werden Softwarekomponenten durch Gebäude in einer Stadt repräsentiert, wobei die Eigenschaften dieser Gebäude verschiedene Metriken der Software ausdrücken können — z. B. könnte die Höhe eines Gebäudes der Anzahl der Codezeilen entsprechen. 1

B

ACRONYMS

SEE Eine interaktive Visualisierung von Software, welche die *Code-City*-Metapher verwendet und einen kollaborativen Multiplayer über verschiedene Plattformen[1] hinweg ermöglicht. 1–4

1 Neben Desktop- und Touch-Umgebungen noch Virtual Reality (z. B. *Valve Index*) und Augmented Reality (z. B. *Microsoft HoloLens*)

C

LIST OF FIGURES

Regie: Kontrolliere am Ende, ob alle bibliographischen Angaben vollständig sind. Wird also die Zeitschrift oder Konferenz aufgeführt, in der ein Artikel veröffentlicht wurde? Sind überall die Seitenangabe aufgeführt? Bei Verweisen auf Web-Seiten, ist überall angegeben, wann der letzte Zugriff darauf erfolgte? Sind Umlaute und andere Sonderzeichen korrekt in LaTeX beschrieben worden?

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