

A Study of Safety-Critical Java and its Specification Applied



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This report documents the development of UniNav, a smartphone application primarily designed to help university students in keeping up to date with their agenda, as well as providing indoor navigation for locating lectures and other points of interests. It also features a visitor mode, helping visitors find points of interests inside buildings. The development consists of two parts, a mobile app for the Android platform, and a web service, with most focus on the mobile application. Currently, the app is designed to work with the Cassiopeia building of Aalborg University, and the software engineer study. The web service automatically handles fetching calendar updates from the internal system, Moodle, and the app is used for presenting this and providing indoor navigation to points of interests, for example where a lecture is held. The report also documents how we used the Scrum development methodology for conducting the development.	

PREFACE

This project has been developed by five Software Engineering master students from Aalborg University, spring 2012. The report documents the development of a mobile application on the Android platform.

The report consists of five parts, excluding the appendix. The first part is an introductory part, which sets the boundaries and limitations of the project. Next there is a preliminary part in which the target mobile platform is investigated. The third part deals with the requirements and design of the application, before moving on to the fourth part which covers the development and implementation of the end product. Finally the project is concluded in a closing part, which discussed the perspectives and the suggestions on the developed application.

Source material referenced in this report will be notated with the initial letter of the surname of the author(s), followed by the year of publication. For example, [Egh11], is a web page written by Egham published in 2011. The source refers to an entry in the bibliography list, where details regarding the source can be found.

Enjoy reading! Group sw804

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CHAPTER
ONE

INTRODUCTION

Listing 1.1: A sample

```
1 #include <future>
2 std::map<std::string, std::string> french
3 {{"hello", "bonjour"}, {"world", "tout le monde"}};
4 int main()
5 {
6     std::string greet=french["hello"];
7     auto f=std::async([&]{std::cout << greet << ", "; });
8     std::string audience=french["word"];
9     f.get();
10    std::cout << audience << std::endl;
11 }
12
13 def main():
14     hehe
```

time consuming I/O

next lookup

CHAPTER
TWO

REAL-TIME SYSTEMS

CHAPTER
THREE

SAFETY-CRITICAL JAVA

CHAPTER
FOUR

JAVA OPTIMIZED PROCESSOR (JOP)

CHAPTER
FIVE

THE CUBESAT SPACE PROTOCOL (CSP)

CHAPTER
SIX

THE CSP IN SAFETY-CRITICAL JAVA

CHAPTER
SEVEN

A CSP BASED WATCHDOG IN SAFETY-CRITICAL
JAVA

CHAPTER
EIGHT

REFLECTION

CHAPTER
NINE

FUTURE WORKS

CHAPTER
TEN

CONCLUSION

BIBLIOGRAPHY

- [Egh11] Egham. Gartner says sales of mobile devices grew 5.6 percent in third quarter of 2011; smartphone sales increased 42 percent. <http://www.gartner.com/it/page.jsp?id=1848514>, 2011. 3