Master's thesis IW: Electronics-ICT – Progress Report of the research

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PROGRESS REPORT ON THE RESEARCH ACTIVITIES: ACADEMIC YEAR: 2008/2009 **REPORT SUBMITTED ON: 12 / 11 /2008**

Subject or title of the PhD research			**Firstname, Familyname promotor**	
WSN localization for SCALA			Jeroen Doggen, Maarten Weyn, Jerry Bracke	
Dates on which foregoing applications or reports were submitted	**Progress reports**	1. 12/11/2008	2.	3.
		4.	5.	6.

ABSTRACT OF THE RESEARCH

The purpose of the thesis is to use a Wireless Sensor Network (WSN) for locating the position of a certain object. We will integrate this application with SCALA. SCALA is a middlware that combines multiple localization-platforms. First we will apply connectivity algorithms to find which room is the closest to a node. Next, we will expand our algorithms to be more accurate. Our work should result in a working application that works real-time.

Short description of the progress of the research work during the past period, mentioning the already obtained results and planning for the next period

General
At First, we wanted to expand the application we created in the theme weeks ICt with the ability to localize objects and to integrated this project with SCALA.

Our promoter Jeroen Doggen advised us not to do this. We had given the assignment to find a project and explore what TinyOS has to offer. After researching, we decided to explore the possibilities of TinyDB. TinyDB is a distributed database for TinyOS. We can explore the possibilities and the performance. This we will do with the simulator TOSSIM. With this research we can improve TinyDB.

We had our doubt about this subject. This is no pratical application for the e-lab. It is also very hard to draw a line where to stop researching.

After conversations with promoters Maarten Weyn and Jerry Bracke, we decided to use Wireless Sensor Networks (WSNs) as a localization platform. The purpose of this is to build an application that reaches further then the lab. Our algorithms need to work in open spaces and in office spaces. This application will be interfaced with SCALA. Some arrangement about this interface needs to be made.

Problems and difficulties
First, we had to come up with a subject for our master thesis. Our promoter Jeroen Doggen, like us, didn't really have an idea. During the vacation in November, we researched a great number of projects and themes. There are many interesting projects, but they don't belong to the theme in the AMBIT group. We would like to see a practical result at the end of our master test.

Planning

A lot of time went into searching for possible subjects. The remaning time will be used to look into the master test of Nick Verbaendert and David Hendrickx, our predecessors. We will research localization algorithms in general en specific for TinyOS and/or Telos rev. B. We have to explore the possibilities of SCALA and study the interfaces. We also might have to learn about java, because the low-level communication between telos rev. B and a pc is written in java. Before 10 November also a poster will have to be made.

Extra info
Attended seminars, presentations, workshops, company visits,... in this period (subject, date, short summary en evaluation)
1.
2.
3.
4.

New contacts in this period (name, First name, e-mail, Telephone number, company, position, relevance for the research)
1.
2.
3.
4.
Articles, books, interviews, etc (title, authors, number of pages, short descriptiong, evaluation (what is the added value for the reserach)
[1] Where do we go from here, Math Welsh, 32 slides, good presentation about research topic in TinyOS, it gives a good overview of the existing research in TinyOS. Math Welsh is researcher for the Code Blue project.
[2] TinyDB: An Acquisitional Query Processing System for Sensor Networks, Sam Madden et al., 46 pages, description of the TinyDB application
[3] The Cougar Approach to In-Network Query Processing in Sensor Networks, Yong Yao et al, 10 pages, description of the Cougar application
[4] Power-Aware In-Network Query Processing for Sensor Data, Jonathan Beaver et al, 17 pages, description of the TINA protocol: network aggregation.
Visum and comments, if any, of the promotor
Date: Signature of the promotor: