Date of latest revision: 2004-10-14

INDIVIDUAL STUDY PLAN

Administrative Data

Name of graduate student: Goran Mustapic

"Personnummer": 691213-1254

Subject of study: Software Engineering

Department: IDt/Computer Science Laboratory

Date of admission: 2002-06-10

Main advisor: Ivica Crnkovic

Co-advisor(s): Christer Norström

"Planeringssamtal" with the graduate student has taken place:

2002-06-10, Several times during 2002 and 2003 with ABB Robotics representatives, 2003-06-13, 2003-06-25, several times during autumn 2003, with ABB Robotics representatives 2003-11-25, several times during spring 2004, June 2004, several times during August and September 2004

People present:

Degree

Ph. D. Degree

The graduate student intends to obtain a Ph. D. degree: Yes

Required no. of credits for the Ph. D. degree thesis work: 110

Required no. of credits for the Ph. D. degree course work: 50

Ph. D. degree planned for (semester): 2007, fall

Licentiate Degree

The graduate student intends to obtain a Licentiate degree: Yes

Required no. of credits for the Licentiate degree thesis work: 50

Required no. of credits for the Licentiate degree course work: 30

Licentiate degree planned for (semester): 2004, fall/winter

Fulfilled Requirements for Ph. D. Degree

Fulfilled fraction of requirements for Ph. D. degree: 50 %

Per semester (including planned achievements):

Semester	Planned	Actual
Fall 02:	10%	10%
Spring 03:	20%	20%
Fall 03:	30%	30%
Spring 04:	40%	40%
Fall 04:	50%	50%
Spring 05:	60%	
Fall 05:	70%	
Spring 06:	70%	
Fall 06:	90%	
Spring 07:	95%	
Fall 07:	100%	

Plan for the Financing of Studies

The studies are funded by ABB Automation Technologies/Robotics donation, Industrial IT project.

Time Spent on Different Activities

Semester	Planned		Actual	
	Research	Dept. duties Other	Research	Dept. duties Other
Fall 02:	70%	30%	60%	40%
Spring 03:	70%	30%	60%	40%
Fall 03:	70%	30%	60%	40%
Spring 04:	70%	30%	60%	40%
Fall 04:	70%	30%	60%	40%
Spring 05:	70%	30%		
Fall 05:	70%	30%		
Spring 06:	70%	30%		

Fall 06:	70%	30%
Spring 06:	70%	30%
Spring 07:	70%	30%

Explanation of low research activity:

According to the employment and project contract, 50% of time is to be spent on doing product development at ABB Robotics.

Brief description of department duties:

Pedagogical education and other education required for carrying out the department duties:

- Courses taught for industry

Fulfilled and Remaining Parts of Studies

Plan for Courses

Completed courses:

1. Forskningsmetodik inom dataområdet ("Research Methodology for Computer Science and Engineering"), CT3340, "D" level, **5 credits**, autumn '02
2. Forskningsprojektplaneringskurs, ("Research project planning course"), Postgraduate level, **5 credits**, spring '03
3. Component Based Software Engineering ("Komponentbaserad mjukvaruutveckling"), CD5490**,** Post-graduate level, **5 credits**, autumn '02
4. Component Based Software Engineering for Embedded Systems (as a part of the "SAVE" project), CD5490**,** Post-graduate level, **5 credits**, spring '03
5. Safety Critical Real-Time Systems ("Säkerhetskritiska System") CT3190, "D" level, **5 credits**, spring 03
6. European Summer School on Embedded Systems (Västerås, Part 3.1 and 3.2 on Real-Time Systems), **2 credits,** summer '03
7. Philosophy of Computer Science, CD5650, Post-graduate level, **3 credits**, spring '04

Planned courses:

Total: 30 credits

Published Papers:

Articles in collection

1. *A Dependable Open Platform for Industrial Robotics - A Case Study*
   Authors: **Goran Mustapic**, Johan Andersson, Christer Norström, Anders Wall,
   Architecting Dependable Systems II
   editors Rogerio de Lemos, Alexander Romanovsky and Cristina Gacek, Springer Oct 2004.

Conferences and workshops

2. *Real World Influences on Software Architecture - Interviews with Industrial Experts*
   IEEE Working Conferance on Software Architectures Oslo , June 2004. IEEE
   Authors: **Goran Mustapic**, Anders Wall, Christer Norström, Ivica Crnkovic, Kristian Sandström, Joakim Fröberg, Johan Andersson
3. *A Dependable Real-Time Platform for Industrial Robotics*
   In ICSE 2003 WADS Portland, OR USA , May 2003.
   Authors: **Goran Mustapic**, Johan Andersson, Christer Norström
4. *Propagation of quality attributes in a layered design*
   SERPS'03 Third Conference on Software Engineering Research and Practise in Sweden, Lund, October 2003
   Authors: **Goran Mustapic**, Ivica Crnkovic

MRTC reports

5. Influences between Software Architecture and its Environment in Industrial Systems – a Case Study
   MRTC Report ISSN xxxx-xxxx ISRN MDH-MRTC-xxx/2004-1-SE, Mälardalen Real-Time Research Centre, Mälardalen University, March 2004
   Authors: **Goran Mustapic**, Anders Wall, Christer Norström, Ivica Crnkovic, Kristian Sandström, Joakim Fröberg, Johan Andersson
6. Component Based Software Engineering for Embedded Systems - A literature survey
   MRTC Report ISSN 1404-3041 ISRN MDH-MRTC-102/2003-1-SE, Mälardalen Real-Time Research Centre, Mälardalen University, June 2003
   Author(s): Mikael Nolin, Johan Fredriksson, Jerker Hammarberg, Joel G Huselius, John Håkansson, Annika Karlsson, Ola Larses, Markus Lindgren, **Goran Mustapic**, Anders Möller, Thomas Nolte, Jonas Norberg, Dag Nyström, Aleksandra Tesanovic, Mikael Åkerholm
7. Modern technologies for modeling and development of process information systems
   MRTC Report ISSN 1404-3041 ISRN MDH-MRTC-100/2003-1-SE, Mälardalen Real-Time Research Centre, Mälardalen University, May 2003
   Author(s): Ivica Crnkovic, **Goran Mustapic**, Mikael Åkerholm

Plan for Thesis Work

The main question that the thesis work is based upon is the following:

> *What are suitable systematic design approaches to increase software system openness in industrial systems, while making appropriate tradeoffs with other relevant concerns and especially end-system quality concerns?*

The research for this thesis is based on literature surveys and case studies. There are several things that need to be understood and investigated:

a) *Understanding of quality and quality concerns is needed.*

   This part of the research project is done through literature surveys.

b) *What are the most important concerns that influence architects of industrial systems?*

   There are differences in "academic" and "industrial view" of software architecture. This part of the research project is done using case study based on interviews with industrial system experts.

c) *Apply methods from Software Architecture and Dependability in realistic projects, where openness is a concern.*

   This part of the research project is done using the case study based on active participation in as a researcher in industrial projects.

Type of Licentiate/Ph. D. thesis: A combination of a monography and paper collection.

Plan for Advising

Extent: On average 4 hours/week

Forms for advising, and distribution of work between advisors:

Cooperation, everyday discussions, work on common papers, technical reports etc., development of Ph.D. courses, etc.

Office Space and Equipment

Standard equipment.

Important Other Parts of the Graduate Education

Research Etics

Course: "Forskningsmetodik inom dataområdet" ("Research Methodology for Computer Science and Engineering"), CT3340,
Course: Philosophy of Computer Science, CD5650,
personal studies, everyday practice.

Theory of Science and Knowledge

Course “Forskningsmetodik inom dataområdet” (“Research Methodology for Computer Science and Engineering”), CT3340,
Course: Philosophy of Computer Science, CD5650,
personal studies, everyday practice.

Ability to Use Relevant IT-tools

4 years of undergraduate study, 10 years of experience as software developer in different environments.

Project Management

10 years of experience in industrial projects, experience as technical leader, main advisor to master thesis

Research Funding

Research project planning course

Cooperative Skills

10 years of experience in industrial projects.

Language proficiency, in Swedish and English

Literature studies, Writing papers and reports, personal experience reading English.

Environmental Aspects in the Education

Standard education; The University’s policies.

Communication with Non-specialists

Cooperation with industry, other communities, writing articles

Ability to Perform Interdisciplinary Work

“Forskningsmetodik” course

Knowledge of Career Possibilities Outside Academia

10 years of industrial experience, cooperation with industry during research.

Signatures

The undersigned hereby approve the contents in the individual study plan according to the above:

October 14, 2004

Graduate student (Goran Mustapic) Supervisor (Ivica Crnkovic)

Decision

Decision to ratify this individual study plan has been taken by the undersigned.