

Master thesis/IT project topics from the edTech group

1. Topic: Development of programming assignment assessment and feedback processes in ViSCoS studies

In the ViSCoS studies, students can submit hundreds of programming assignments per course. Currently assignments are submitted via the submission box in the Moodle learning environment, which makes the process rather labor intensive for teachers. In this topic, the aim is to enhance the programming assignment assessment and feedback processes in ViSCoS studies. The work may include following tasks; investigating the applicability of existing (open source) solutions for assessment of programming exercises in ViSCoS, setting up a prototype system for smoothing up the assessment and evaluation of programming assignments and evaluation of the prototype.

Supervision/Contact: Jarkko Suhonen; firstname.lastname@cs.joensuu.fi

2. Topic: Analysis and improvement of online teaching practices between Imatra high school and School Nr. 238 in St. Petersburg

Imatra high school in the town of Imatra has several years experience of online teaching with near by schools in Russia and town of Lappeenranta. In the master thesis work, the aim is to evaluate the experiences of the current online teaching between Imatra high schools and school in St. Petersburg and to analyse the applied technologies/teaching methods. Furthermore, the aim is to create a design how to enhance the current online teaching practices between the two schools.

Imatra school can offer travel grants to visit the School Nr. 238 in St. Petersburg. They will cover the travel costs, accommodations, visa and living expenses. The work does not require a student with Russian language, since the Imatra High school can provide Russian translator during the visit.

Note: The funding to cover the expenses is only available until the end of May.

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3. Topic: Building an ICT model for participatory rural development

This interdisciplinary and innovative research aims at combining aspects of ICT design with rural sociology. This Master thesis should deliver:

- a comprehensive literature on the use of ICTs for rural development in Finland (ongoing projects, strengths and weakness of such projects, uses and trends in ICT4RD in Finland)
- a methodology to develop a participatory approach to rural development based on the use of ICTs (the focus will be more on the enhancement of local strengths

- than on the needs). Research in the field – in the area of Koli and Vuonislahti – and collaboration with local rural communities will be required.
- an evaluation of the activities carried out in these two rural villages. The evaluation will be important in order to develop “best practices” and a model of ICT for rural development based on the Karelian example.
 - interactions with other master students working on the same ICT4RD project (or area) will be required

Supervision/Contact: Silvia Gaiani, silviagaiani@[REMOVE_SPAM]yahoo.it

4. Topic: E-heritage project at Limpopo, South Africa

Collection management in museums, heritage conservation and archives in the provinces are in desperate need to be upgraded. The Provinces require a portal where researchers, scholars, teachers, tourists and the citizen at large have easy access to information resident in our heritage institutions. There is a variety of database systems in use, which are old and not compatible with one another or worth further development hence, a need for a new and fresh approach.

The overall aim of the e-Heritage project is to promote, protect and develop sport and the diverse cultures of both Provinces and at the same time be catalysts in development programmes, economic empowerment and other activities thereby entrenching nation building and social cohesion.

EdTech research group at University of Joensuu is a key member of the e-Heritage project together with University of Limpopo and University of Lapland. The e-Heritage project will involve three IMPIT master students from University of Joensuu and one from University of Lapland spending a few months in Limpopo to research and develop e-Heritage technologies to preserve and disseminate cultural heritage of the Limpopo area. IMPIT students will collaborate with the students and researchers at University of Limpopo during the work process.

The IMPIT students will be responsible for software development in general, and in particular in user-interface design, database design, and program implementation. After the development, the students can continue on deeper analysis of the problems as part of the research conducted for a Master’s thesis.

Funding:

The project will provide the following funding for the field work carried out in Limpopo

- scholarship of 450€/month for the duration of fieldtrip period
- flights between Joensuu and Limpopo
- accommodation

Supervision/Contact: Teemu Laine and Erkki Sutinen, firstname.lastname(at)cs.joensuu.fi

5. Topic: Social studies of Computer Science

See list of topics from: <http://www.tedre.name/graduaiheet.html>

Supervision/Contact: Matti Tedre, firstname.lastname@cs.joensuu.fi

6. Topic: Enhancing plagiarism detection capabilities of EssayAid

EssayAid is an automatic assessment tool for students' writings that consists of two components: Automatic Essay Assessor (AEA) is a content-based grading system, which uses both reference texts (such as course textbooks and lecture notes) and human-graded essays for automatically grading essays. AntiPlag is a plagiarism detection system that compares a student's text against other students' contributions and internet sources to find if some of the sections in the text are copied.

The aim of the project is to design and implement advanced detection methods to AntiPlag. These include, for example, inexact string match techniques and synonym detection methods. The project offers a good basis for a master's thesis and/or PhD thesis research.

Supervisor/information: Tuomo Kakkonen, Niko Myller,
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7. Topic: Integration of EssayAid and Moodle

EssayAid is an automatic essay assessment tool that consists of two components: Automatic Essay Assessor (AEA) is a content-based grading system, which uses both reference texts (such as course textbooks and lecture notes) and human-graded essays for automatically grading essays. AntiPlag is a plagiarism detection system that compares a student's text against other students' contributions and internet sources to find if some of the sections in the text are copied.

The aim of the project is to integrate EssayAid with Moodle course ware.

8. Topic: Automatic Dialog Filter

The project is connected to the detection of potential misunderstandings in inter-cultural communications. It is important, for example, when writing a peace-agreement between two nations to make sure that both parties understand the terms exactly the same way in order to avoid any conflicts in implementing the agreement. In this project, the student's task is to implement, by the help of the supervisors, a Java tool that finds potentially problematic words and phrases in documents.

Supervisor(s):
Prof. Erkki Sutinen, Dr. Tuomo Kakkonen

Req. skills, background:
Java programming

Funding:
Please, contact Prof. Sutinen

9. Topic: Development of learning materials for ViSCoS studies

The aim is to contribute to the design and development of learning materials for ViSCoS intermediate courses. The student is expected to investigate how freely available existing learning materials found in the Internet can be used in two courses: Introduction to Software Development and Data Structures and Algorithms. The student is also expected to design and develop graphics (e.g. picture related to the course content), course exercises and examples in collaboration with ViSCoS teachers. One part of the work will also include an analysis how existing learning tools can be used in the courses to support students' learning processes. The student is expected to conduct an extensive search related to the content of the courses to find suitable tools to be used in the courses. Finally, the student is expected to find concrete examples of existing online and blended learning solutions to be utilized also in the ViSCoS courses..

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10. Other topics

Please visit the website http://cs.joensuu.fi/~jsuhon/thesis/thesis_list.htm