



Newsletter December 2015

from the ITS Postgraduate school (NFITS)

The ITS Postgraduate school started in 2008 and at the moment there are 15 PhD-students enrolled. During 2015, there has been one PhD-defence (Mahmood Rahmani, presented in Newsletter June 2015) and we have welcomed three new PhD-students. Two of them are presented below (the third was presented in the June newsletter).

During the last years there has been a small decrease in inflow of new PhD-students and from NFITS we need to work hard to recruit new students. To engage new PhD students, we need not only ensure funding to cover the salary of the PhD student and other project costs but also generate good research ideas and establish good cooperation with relevant companies and organizations. We believe research and education is very important for the development of ITS and NFITS will therefore try to contribute as much as possible to the ongoing work to develop the national ITS Strategy and Action Plan.

We welcome two new PhD-students



Carl Johnsson, Lund University, Development and Test of Methods and Tools to Analyse Traffic Safety of Vulnerable Road Users

Carl Johnsson's PhD study focuses on the development and test of an ITS based tool (video technology) to collect data on safety critical events, related to behavioural indicators in real traffic environment as a complement to accident data, which is notoriously known to be underreported, particularly for Vulnerable Road Users (cyclists, pedestrians, moped riders). Video recordings and automated tracking systems can be used to generate trajectories of road users which can be used to identify Traffic Conflicts. The development of the method includes the automatic image process through video records that makes observations possible also during adverse periods and in several places, where the access for human observers is difficult.

Carl Johnsson has a degree in Transportation Engineering from Linköping University and started his PhD employment at Lund University on the 24th of August 2015. Carl's supervisors are Prof. András Varhelyi and Dr. Aliaksei Lareshyn from Lund University.

Nils Breyer, Linköping University, Travel demand analysis based on large scale sensor and cellular network data

Nils Breyer's PhD study will focus on data-driven traffic modeling and specifically estimation of travel demand in cities and metropolitan areas, based on signaling data in cellular communications networks (mobile phones). The applications of the demand estimations range from urban traffic management systems to long-term infrastructure planning.



Nils has studied Computer Science with specialization in railway traffic at TU Braunschweig, Germany and has MSc degree in Intelligent Transport Systems and Logistics from Linköping University. His thesis work considered traffic flow estimation from cellular network data and was made in cooperation UC Berkeley, California, within the project Mobile Millennium Stockholm (MMS). Nils starts his PhD employment the first of January 2016. Supervisors are Ass Prof. Clas Rydbergren and Prof. Di Yuan, Department of Science and Technology, LiU.

All projects

The current PhD student research projects associated with NFITS are the following (where the PhD students' names are given in parenthesis):

1. ITS services and decision support for freight transportation

- a. Electric Fleet Optimization in Real-Time (Rafael Basso)
- b. Real-time Access and Guidance Control (Stefan Jacobsson)
- c. Enhanced Transport Security and Efficiency for HazMat (Camilla Magnusson Nyquist)
- d. E-waybill solutions (Shoaib Bakhtyar)

2. ITS services and decision support for public transportation

- a. Multimodal planning: Modal choice and integrated traffic assignment (Gerasimos Loutos)
- b. Multi-Agent Based Simulation of Commuting in Urban Areas (Banafsheh Hajinasab)

3. Traffic management and traffic information systems

- a. Traffic state estimation and prediction (Andreas Allström)
- b. Calibration of Dynamic Traffic Assignment models (Athina Tympakianaki)
- c. Digital infrastructure for railway traffic management (Talin Jadaan)
- d. Travel demand analysis based on large scale sensor and cellular network data (Nils Breyer)

4. Automation, driver support and road traffic safety

- a. Cooperative systems (Ellen Grumert)
- b. Optimal strategies for platooning and effect evaluation (Qichen Deng)
- c. Reliable vehicular communications (Nikita Lyamin)
- d. Advanced rider assistant systems for improving motorcycle safety (Noor Azreena Kamaluddin)
- e. Development and Test of Methods and Tools to Analyse Traffic Safety of Vulnerable Road Users (Carl Johnsson)

If you are interested in reading the theses or other publications associated with the PhD students, please visit the publication list on our website <http://www.its-sweden.se/Forskarskolan>

PhD course – Introduction to ITS

The PhD course "Introduction to ITS" with the two parts "ITS basics – Evaluation basics" (10 ETSC credits) has been run during the Spring and Autumn semesters of 2015 and has been administered jointly by CHALMERS and Lund University. The responsible teachers have been Stig Franzén and András Varhelyi. Six of the PhD students enrolled in the ITS Postgraduate school participated in the course. The aim of the course was to help participants to adopt a scientific approach, knowledge and understanding of ITS applications from different perspectives, as well as how the effects of ITS applications can be evaluated with respect to functionality, user related criteria, traffic effects and transport policy goals.

The course comprised lectures and seminars, own work in the form of literature studies and analysis of an ITS project/case. The participants performed a number of home assignments where they presented their analyses/solutions on a total of eight face-to-face meetings. Peer-reviewing by fellow course participant was practiced, which means that the finalised homework of the final assignment was read by a fellow student, the "reviewer", who at the final seminar gave his/her opinion and comments on the report. The participants have expressed their satisfaction with the course content and the knowledge they gained during the course.

The ITS World Congress in Bordeaux

Seven PhD students and four supervisors attended the ITS World Congress. Most of the PhD-students were active at the congress, gathering information for the assignments in the PhD course Introduction to ITS. A workshop was organized where the PhD-students presented their projects. The workshop did get a lot of attention during the congress, but the number of attendances could have been better.

Other notes from the Fall 2015

- Four PhD-students and two former students participated in the National Transport Conference held at Karlstad University on October 21-22.
- Alexey Vinel from Halmstad University organized the 14th International Conference on ITS Telecommunications on December 2-4 in Copenhagen.

Preliminary plans and activities for NFITS for 2016

- The traditional yearly workshop where all PhD-students present and discuss their research projects will be organized by Lund University on May 12-13.
- A new PhD-course will start in the later part of the spring semester or in the early fall. The topic is not yet decided.
- Qichen Deng will present his licentiate thesis on March 8 at 13.00 in room Ångloket at Teknikringen 10, KTH. And several more PhD-students are expected to present their licentiate and doctoral thesis during the year.
- Athina Tymphakianaki is spending three months in a research visit at Northeastern University, Boston.

**Finally, we would like to wish you a Merry Christmas and a Happy New Year
and thank all of you whom have been involved in NFITS.**

Especially, we would like to thank VINNOVA, Trafikverket and ITS-Sweden

About the Swedish ITS Postgraduate school - NFITS

The area of Intelligent Transportation Systems and Services (ITS) is known to be multi-disciplinary where different areas of competence meet to achieve sustainable, safe and cost-effective traffic and transport systems. The research frontier in the ITS area has earlier primarily been divided according to the different disciplines while there has been a need for research projects and researchers which go beyond their specific domains with a wider perspective to address relevant issues in a larger context than before. The primary purpose of the ITS Postgraduate School is therefore to strengthen the Swedish research education within ITS by providing a good, multi-disciplinary virtual research environment and a platform for cooperation between researchers in different areas of competence. Another important objective is to initiate and run research projects highly relevant for the industry and the society. For more information, please visit our website <http://www.its-sweden.se/Forskarskolan>.

Below is a list of the PhD students associated with NFITS, where * indicates NFITS alumni (with a licentiate or doctoral degree).

Gideon Mbiydzenyuy*	Blekinge Institute of Technology
Shoaib Bakhtyar	Blekinge Institute of Technology
Tor Skoglund*	Chalmers University
Niklas Strand*	Chalmers University
Stefan Jacobsson	Chalmers University
Rafael Basso	Chalmers University
Nikita Lyamin	Halmstad University
Jana Sochor*	KTH Royal Institute of Technology
Mahmood Rahmani*	KTH Royal Institute of Technology
Athina Tympakianaki	KTH Royal Institute of Technology
Qichen Deng	KTH Royal Institute of Technology
Lars Backåker*	Linköping University
Andreas Allström	Linköping University
Ellen Grumert	Linköping University
Gerasimos Loutos	Linköping University
Nils Breyer	Linköping University
Annika Larsson*	Lund University
Omar Bagdadi*	Lund University
Camilla Nyquist Magnusson	Lund University
Noor Azreena Kamaluddin	Lund University
Carl Johnsson	Lund University
Banafsheh Hajinasab Razlighi	Malmö University
Åse Jevinger*	Malmö University
Taline Jadaan	Viktoria Institute

The ITS Postgraduate School is mainly funded by VINNOVA and Trafikverket which are represented in NFITS by Eva Schelin (VINNOVA) and Bengt Hallström (Trafikverket). The work in NFITS is planned and executed by a research council (Sw. Forskarutbildningsråd, FUR) which is composed of the following members during 2015:

Christer Karlsson, ITS-Sweden
MariAnne Karlsson and Stig Franzén, Chalmers University
Per-Olof Arnäs and Gunnar Stefansson, Chalmers University
Alexey Vinel, Halmstad University
Albania Nissan, KTH Royal Institute of Technology
Jan Lundgren and Johanna Törnquist Krasemann, Linköping University
András Várhelyi and Henrik Sternberg, Lund University
Paul Davidsson and Jan Persson, Malmö University

NFITS is coordinated by ITS-Sweden. The director of the ITS Postgraduate School is Prof. Jan Lundgren, Linköping University.