



Newsletter Dec 2014

from the ITS Postgraduate school (NFITS)

Since the area of Intelligent Transportation Systems and Services (ITS) is known to be broad and multi-disciplinary, also the scope of our postgraduate school is quite broad but we have chosen to group the different research projects into four main thematic areas:

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. Travel Time Distribution Estimation Using Floating Car Data (Mahmood Rahmani)
 - c. Calibration of Dynamic Traffic Assignment models (Athina Tympakianaki)
 - d. Digital infrastructure for railway traffic management (Talin Jadaan)
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)

Recently, the freight transport area was strengthened with three new Ph D students. Below are some brief information about these researchers and other information concerning the development within NFITS during this past summer and autumn.



Stefan Jacobsson (left) has been working several years in the transport and logistics industry. He is now working at the consultant company Consenso as an industrial Ph.D. student since September 2014, associated with the Division of Logistics and Transportation at Chalmers under the supervision of Dr. Per-Olof Arnäs and Dr. Gunnar Stefansson. Stefan's research is focusing on intermodal transportation in combination with information and communication technology (ICT). The goal is to solve bottlenecks in the hubs (terminals, ports) by using different real-time ICT applications like access and guidance control. The three main challenges concern data collection, data fusion and real-time decision-support. The research is conducted within the project REACH (Real-time Access and Guidance Control in Qualifying Transportation Systems), which is funded by the program FFI (Fordonsstrategisk Forskning och Innovation).

Nikita Lyamin (right) has a Master's degree in Telecommunications from the Siberian State University and he is since August 2014 working as a Ph.D. student at Halmstad University under the supervision of Prof. Alexey Vinel. Nikita is working with vehicular ad-hoc networks (VANETs) which constitute an important part of Intelligent Transportation Systems with the aim to increase road safety, efficiency and driving comfort. Nikita's specific research focus is on reliability and security issues of inter-vehicular communications in connection to the ongoing standardization activities in Europe.



Beaconing triggering rules, distributed channel congestion control, denial-of-service attacks and misbehavior detectors as well as other related mechanisms to support cooperative awareness between the vehicles in VANETs will be thoroughly investigated. The research is conducted as a part of the "ACDC: Autonomous Cooperative Driving: Communications Issues" project (2014-2016) funded by the Knowledge Foundation in cooperation with Volvo GTT, Volvo Cars, Scania, Kapsch TrafficCom and Qamcom Research & Technology.



Camilla Magnusson Nyquist (left) has been working in the ITS industry for several years. She is since March 2014 working as a Ph.D. student at the Division of Packaging Logistics, Lund University supervised by Dr. Daniel Hellström, Lund University and Dr. Magnus Andersson, Viktoria Swedish ICT. Camilla's research has a special focus on the relation between measures and effects of security and efficiency. ITS is an important tool but organisational aspects will be considered as well. The goal is to facilitate the strategic planning of investments in measures for security and efficiency at companies, as well as the development of policies for control of freight transports at authorities. Camilla's research is financed by the Swedish Civil Contingencies Agency (MSB), as part of the project HITS, Harmonized Intelligent Transportation Systems for Transport of Dangerous Goods, that runs from 2014 to 2015.

The HITS project aims at performing research and generating incentives so that transporters voluntarily increase transportation security for dangerous goods.

Rafael Basso (right) is working as an industrial Ph.D. student at Volvo Technology since July 2014, associated with the Division of Signal and Systems at Chalmers and supervised by Dr. Balázs Adam Kulcsár and Dr. Per-Olof Arnäs. Rafael is working in a research project named "EL FORT" – Electric Fleet Optimization in Real-Time, and focuses on city logistics using electric distribution vehicles. The project proposes a system to support the use of electric distribution trucks in urban environments, by optimizing the use of the complete fleet, instead of focusing on single vehicles. The system takes into account real-time traffic information, such as congestion, and vehicle information, such as battery state and cargo information, to dynamically assign missions and routes to each vehicle in the most cost-efficient way. The result is that every vehicle receives appropriate missions dynamically and will drive along routes optimized in real-time, thereby increasing efficiency of the complete fleet and contributing positively to traffic flow.



Thesis defences

During the autumn, NFITS had the pleasure to congratulate the NFITS alumni Tor Skoglund (leftmost photo) from Chalmers and Åse Jevinger (rightmost photo) from Malmö University, to receive a doctoral degree.



Tor defended his doctoral thesis "Effects of long-term access to ICT-mediated travel information services" on September 15th. Åse defended her thesis "Toward Intelligent Goods: Characteristics, architectures and applications" on November 21st.

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



Doctoral courses

During September-December 2014, the course *Freight transport and ITS/ICT* (8 credits) has been running. It is organized and given by Per-Olof Arnäs and Gunnar Stefansson, Chalmers and Henrik Sternberg, Lund University. More information can be found on our website <http://www.its-sweden.se/Forskarskolan> under "Research education".

Annual retreat at Hasseludden, Stockholm

On November 27-28th, NFITS held the annual gathering and this time at Hasseludden. 24 participants from the partner universities attended and during the 2nd day the Vinnova representative Eva Schelin took part. The program consisted of primarily research presentations according to a pre-defined framework with allocated reviewers and following discussions. A smaller workshop regarding the future objectives and plans for NFITS was also held. The next large gathering will be held in May 2015 (preliminary).

Preliminary plans for NFITS during 2015

During 2015 there are some preliminary plans for a number of NFITS gatherings:

- A 3-day study trip is planned in the end of May. Dates, location and program will be announced during the beginning of 2015.
- Gathering in conjunction with the ITS World Congress in Bordeaux.
- Annual retreat end of 2015.

The mandatory NFITS course "Introduction to ITS" will be given during 2015. Course plan and schedule will be announced in due time.

During the coming spring, a number of theses defences will be organized and information about these will be published accordingly on our website.

Finally, we would like to wish you Happy Holidays

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 domain 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 Ph D students associated with NFITS, where * indicates NFITS alumni (with a licentiate or doctoral degree).

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| 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 |
| Annika Larsson* | Lund University |
| Omar Bagdadi* | Lund University |
| Camilla Nyquist Magnusson | 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 (formerly known as Banverket and Vägverket) 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 will be 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, Lund university
Henrik Sternberg, Lund university
Paul Davidsson and Jan Persson, Malmö University

NFITS is coordinated by ITS-Sweden. The main and assisting director for the ITS Postgraduate School are Prof. Jan Lundgren and Dr. Johanna Törnquist Krasemann, Linköping University.