Newsletter December 2016 from the ITS Postgraduate school (NFITS)

Looking forward to 2017

The Swedish ITS Postgraduate school will go into its 10th year of activities in 2017. The overall aim of the school is to strengthen research and education in the field of ITS. We do this by gathering PhD-students interested in ITS and offering them activities and a network of people. This includes other PhD-students, senior researchers, alumni students and representatives from industry and other relevant organisations. Activities include doctoral courses, conferences, seminars and workshops. We believe our school gives a strong added value to the regular doctoral studies they are doing at their home universities. The PhD-education is in this way improved and we create a group of researchers that feel they belong to the ITS society.

During the nine years of activities we have seen 9 PhD-students receiving a Doctoral degree and 3 PhD-students receiving a Licentiate degree. These students have left the school, but are still in our network. The dissertations and research papers of the students cover many aspects of the ITS field and hopefully the research will make an impact. What we know for certain is that the graduates themselves will make an impact. The most valuable result from a PhD-project is often the person herself and all the achievements this person will make in the future based on the knowledge obtained during the PhD-studies. We are happy to see that our alumni students have obtained relevant positions after finishing their studies.

In 2016 the ITS Postgraduate school has been active in the work to develop the national ITS strategy and Action plan. Education, research and knowledge building is in the strategy considered as an enabling area for the development of the priority areas. The senior members of ITS Postgraduate school have contributed both with a description and an action plan for this enabling area and in the discussions of the working groups for the priority areas. We believe that the outcome of the strategy work and action plans will be a number of activities emphasizing and promoting research and education related to ITS. And the ITS Postgraduate school will be happy to be part of this development.

When this year ends, we have 14 PhD-students enrolled in our postgraduate school. Three of them who started recently are presented shortly below.

New PhD-students

David Leffler and **Anna Vasilevskaya** will both work in the project *Simulation and Modeling of Autonomous Road Transport*, financed by the Swedish Transport Administration (Trafikverket). The project will focus on traffic effects from the introduction of autonomous vehicles. Study aim is to enhance and further develop today's state-of-the-art traffic models in order to enable analysis of future traffic systems. The tool used will be microscopic traffic simulation where the behaviour of and interaction between conventional and automated vehicles is captured. David is a PhD-student at KTH and Anna is PhD-student at Linköping University and she also works at VTI.

Anastasios Koutoulas is a PhD-student at KTH and will work on the project *Off-peak hour logistics.* The project aims to create new knowledge by studying the effects and results from ongoing trials and tests of new solutions for off-peak hour deliveries, and to propose regulatory principles for such deliveries.

Thesis presentation

Nikita Lyamin at Halmstad University presented his licentiate thesis with the title "Performance evaluation of C_ACC/platooning under ITS-G5 communications" on December 6, 2016.

Summary: Platooning is an emerging vehicular application aiming at increasing road safety, efficiency and driving comfort. In the thesis the performance of platoons enabled by contemporary ITS-G5 vehicular communications is evaluated. The cooperation between the vehicles in a platoon is assumed to be achieved by the frequent exchange of periodic broadcast Cooperative Awareness Messages (CAMs). CAMs are triggered as specified in the ETSI EN 302 637–2, are processed by the Decentralized Congestion Control (DCC) as a mandatory component of ITS-G5 stations and, finally, are transmitted in accordance to the IEEE 802.11p CSMA protocol. Some insights about the performance of V2V communications as well as their impact on the resulted vehicles fuel efficiency are provided.

Other notes from the fall 2016

- Stefan Jacobsson, Chalmers, presented his research *Information exchange in differentiated access management for intermodal freight transportation* at the World Conference on Transport Research (WCTR) in Shanghai in July.
- Several PhD-students and senior researchers participated in the National Transport Research Conference, held in Lund on 18-19 October.

Preliminary plans and activities for NFITS for 2017

- A new round of the basic PhD-course "Introduction to ITS" will start in the spring 2017. This course is mandatory for all PhD-students in NFITS, but it is also open for other PhD-students and interested persons in industry. The first part, *ITS Basics*, is given by Chalmers University starting in March 2017. Contact Stig Franzén (stigf@chalmers.se) for more information. The second part is given by Lund University starting in August 2017. Contact András Varhelyi (andras.varhelyi@tft.lth.se) for more information.

- The annual workshop in 2017 is planned to be held on the Swedish west coast with Halmstad University as host.

All projects

The current research projects of the PhD students associated with NFITS are as follows (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. Off-peak hour logistics (Anastasios Koutolas)

2. ITS services and decision support for public transportation
   a. Multi-Agent Based Simulation of Commuting in Urban Areas (Banafsheh Hajinasab)

3. Traffic management and traffic information systems
   a. Calibration of Dynamic Traffic Assignment models (Athina Tympakianaki)
   b. Digital infrastructure for railway traffic management (Taline Jadaan)
   c. 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. Reliable vehicular communications (Nikita Lyamin)
   c. Advanced rider assistant systems for improving motorcycle safety (Noor Azreena Kamaluddin)
   d. Development of Methods and Tools to Analyse Traffic Safety of Vulnerable Road Users (Carl Johnsson)
   e. Simulation and Modelling of Autonomous Road Transport (David Leffler and Anna Vasilevskaya)

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

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 for their support

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). For the alumni the current employer is indicated in brackets.

Gideon Mbiydzenyuy*	Blekinge Institute of Technology (Netport and Borås University)
Shoaib Bakhtyar*	Blekinge Institute of Technology
Tor Skoglund*	Chalmers University (Sweco)
Niklas Strand*	Chalmers University (VTI)
Stefan Jacobsson	Chalmers University
Rafael Basso	Chalmers University
Nikita Lyamin	Halmstad University
Jana Sochor*	KTH Royal Institute of Technology (Chalmers University)
Mahmood Rahmani*	KTH Royal Institute of Technology
Athina Tympakianaki	KTH Royal Institute of Technology
Qichen Deng*	KTH Royal Institute of Technology (Delft University)
David Leffler	KTH Royal Institute of Technology
Anastasios Koutolas	KTH Royal Institute of Technology
Lars Backåker*	Linköping University
Andreas Allström*	Linköping University (Sweco)
Ellen Grumert	Linköping University
Nils Breyer	Linköping University
Anna Vasilevskaya	Linköping University
Annika Larsson*	Lund University (Autoliv)
Omar Bagdadi*	Lund University (Transportstyrelsen)
Camilla Nyquist Magnusson	Lund University
Noor Azreena Kamaluddin	Lund University
Carl Johnsson	Lund University
Banafsheh Hajinasab Razlighi	Malmö University
Åse Jevinger*	Malmö University (Malmö University)
Taline Jadaan	Viktoria Institute

The work in NFITS is planned and executed by a research council (Sw. Forskarutbildningsråd, FUR) which currently includes the following members:

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

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The director of NFITS is Prof. Jan Lundgren, Linköping University.