



Intelligent
Transport Systems

SEE-ITS
2nd Workshop
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Who is ITS?

Why do we need expertise?

> Technology is networking.



Human Resources - situation now

- ITS implementation proceeding very fast
- Substantial ITS Research Programmes for many years
- Minimal investment in ITS Education and Training to date
- Very patchy ITS Education & Training across Europe
- Often rigid University Faculty structures
- No clear ITS career structure with Professional recognition
- A largely unskilled 'workforce' who are learning on the job
- Demand for ITS Professionals outstripping supply
- Inevitable inefficiencies in ITS design, deployment and operations

What do we expect from an ITS engineer?

- Who are “we”?
- Systems approach?
- What do we mean by this?
 - Transport System?
 - Technology? (Sensors, Telecom, Comp. Science) ... Telematics
 - Leading interdisciplinary teams?
 - Business concepts?
 - Law? Politics?
- Can ask the right questions!
- Acts as mediator (politics, technology, user, law, standards)
- Ensures interoperability and intermodality

How should the ITS-Engineer be educated?

- On the Job?
- Off the Job?

- In the frame of which academic studies?
 - Business/Economy?
 - Technology?
 - BSc / MSc / PhD?
 - If MSc, then which preceding BSc?
 - Example: How much should be known about TPEG or RFID?

- How does the competence profile look like?
 - Are there more than one?

Who needs additional ITS expertise?

- Transport decision/policy makers
- Research policy makers
(compare to nano-/bio-tech research funding and brain attraction)

- Civil Engineers (road/rail infrastructure construction)
- Transport planners
- Vehicle constructors

- Media
- Users??

Example – Section Control in Vienna



Who are the ITS-Engineers now?

- Different Backgrounds:
Comp. Science; Electronics, Physics; Civil Engineering; Machine Engineering; Economics; Law; Psychology; Mathematics; ...
- Very few with specialized background

- Education & Training Initiatives in Europe
- Network: ITS-EduNet ... www.its-edunet.org
- Academic programs:
 - Vienna: “Transport and Environment” - BSc
“Intelligent Transport Systems” – MSc
 - Prague: “Intelligent Transport Systems” - BSc and MSc
 - Linköping: „ Intelligent Transport Systems and Logistics”– MSc
 - Munich: „Transportation Systems“ – MSc
 - Torino: „Infomobility“ – MSc
 - Zagreb: „ Intelligent Transport Systems and Logistics”– MSc

Multiple Degree Master in ITS

- **Partners**
 - **UAS Technikum Wien, Austria**
 - **Czech Technical University Prague, Czech Republic**
 - **Linköping University, Sweden**
- **Language of instruction:**
 - English
- **Duration**
 - 4 Semesters
- **Admission**
 - Entrance exam / 30 places per year
- **Credits**
 - 120 ECTS credit points

Curriculum - MSc

- Transport Telematics
 - Transport and traffic engineering
 - Computer science; Telecommunication; Sensor technology
- Special Tools
 - Applied Mathematics and Physics, Control Theory
 - Traffic Modelling and Simulation
 - GIS, Positioning, Navigation
- Practical Part
 - Project-based-learning
- Multidisciplinary
 - Combine specialized knowledge with broad understanding of ITS.
 - Focus on transportation applications already from start

Curriculum MSc 2

- Non-technical-part
 - Traffic Psychology and Human-Machine Interface
 - Management and Leadership Training
 - Law
- Specialisation
 - ITS System Architecture
 - Cooperative Systems
 - Advanced Driver Assistance Systems
 - Safety and Sustainability
 - Embedded Systems, Dependable and Distributed Systems
 - Traffic Safety Audit
 - ITS in Logistics and Fleet Management
 - ...

Our graduates work at

- Infrastructure Companies
 - Road Operators
 - Rail Operators
 - Air Traffic Control
 - Inland Waterway Operators
 - Public Transport Operators
- System Suppliers
 - E.g. Kapsch, Siemens, Thales, Eikon,
- Service Providers
 - Traffic Information Providers, Routing/Navigation Providers
- ITS Consultancy Companies
- Research Institutes

ITS-EduNet www.its-edunet.org

- Network for Training, Education and Outreach in the field of ITS
- registered association, founded on the 25th of September 2007, based in Munich, Germany
- main objective:
 - **to improve and promote ITS at the European Level, mainly by enhancing the training and education in ITS and by bringing forward pan-European knowledge exchange in order to reach a uniform level**

ITS-EduNet activities

- encourage the **sharing of resources** and **exchange of information** through the establishment of a **knowledge database**
- improve the **exchange and networking between universities** and other legal entities who are interested in improving ITS training and education
- organize **short courses and seminars**
- undertake initiatives to **raise the general awareness of ITS.**

Definition of ITS

“ITS integrate telecommunications, electronics and information technologies - in short, ‘telematics’ - with transport engineering in order to plan, design, operate, maintain and manage transport systems.

This integration aims to improve safety, security, quality and efficiency of the transport systems for passengers and freight, optimising the use of natural resources and respecting the environment.

To achieve such aims, ITS require procedures, systems and devices to allow the collection, communication, analysis and distribution of information and data among moving subjects, the transport infrastructure and information technology applications.“

(ITS-EduNet, 2009)

Used in Wikipedia and in the „ITS EU Directive“!

ITS-EduNet members

- Full members - Universities
 - TU Munich
 - Univ. of Southampton
 - CTU Prague
 - UAS Technikum Wien
 - KTH Stockholm
 - Univ. of Ljubljana
 - Linköping University
 - Politecnico di Torino
 - TU Graz
- Associated members
 - ITS Norway
 - ITS Bretagne

Human bound Problems 1

- What is this?
- Who wants to study “this”? Why? (no heroes! no role models!)
- What does the Industry/Economy need??
 - Project and Problem driven (short time horizon) vs.
 - Long time HR-Planning
- Who should teach?

Human bound Problems 2

- National vs. private economical thinking
- Intermodality – only possible through the people involved
- Awareness vs. user friendliness
- Safety and sustainability vs. privacy and liability
- Slow/heavy System
- Decisions need competence
 - Otherwise responsibility is not taken

ITS-Professionals Vision

- Modern Transport Engineers (J. Sussman's vision - MIT)
- Educational opportunity “This is what I want to study!!”
- Visible as career opportunity

- We need more **Transportation/ITS Heroes**
 - The people behind the systems must step forward!!!!

Thank you for your attention!

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