Introduction Programme

Frans von der Dunk

Roadmap

- Introduction tutors
- Introduction participants
- Introduction tutorial
  - Aims – *'what you should take home'*
  - Scope – Framework(s) GNSS applications
  - Structure – the various modules
- Introduction reference cases
- Introduction reference materials

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Tutors (1)

- **Rob Postema**
  - Principal Business Consultant Space at Logica
    - Activities, amongst others, focus on business development for GNSS downstream applications and services
  - Has been involved in the Galileo programme, as well as projects addressing the technical, and service aspects of GNSS downstream services and applications
    - AGILE: GNSS & location-based services
    - M-Trade: GNSS & multi-modal transportation

Tutors (2)

- **Tanja Masson-Zwaan**
  - Deputy-Director IIASL, Leiden University
    - A
  - President, International Institute of Space Law
    - A
  - Ad Astra consultancy
    - M

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Tutors (3)

■ Frans von der Dunk

➢ Director of Black Holes consultancy

➢ Legal Task Manager projects defining Galileo

◆ GALILEI study cluster: the whole spectre

◆ GIANT: GNSS & aviation

➢ Member EC expert group on GNSS liability

➢ Professor Space Law, University of Nebraska-Lincoln

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Participants

■ Please introduce yourselves:

➢ Educational / vocational training background

➢ Professional background, current employment & current employer

➢ Experience with GNSS in general, & specific GNSS applications in particular

➢ Reasons for participating & aims participation

➢ Possible contributions to GNSS, GNSS applications & the tutorial

The tutorial (1)

■ Objective & mission:

➤ The course provides an overview of the elements necessary to develop aviation services, based on satellite navigation, and to introduce them into the operational environment

➤ With the course, the participants will develop insights into all the crucial aspects for developing successful aviation applications, alternatively for properly regulating and stimulating it, and provide the framework for more detailed analysis

The tutorial (2)

- ■ Participants will develop:
  - ➢ Insight in systems, potential of signals & services
  - ➢ Understanding architecture to provide downstream aviation services
  - ➢ Understanding underlying service & business models to introduce satnav services in aviation
  - ➢ Familiarity institutional & legal framework applicable to satnav services in aviation
  - ➢ Ability to develop further regulatory, institutional, policy & business frameworks downstream
  - ➢ *All of the above: as focused on liability issues*

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Scope tutorial (1)

- **GNSS & GNSS-based services**
  - ➤ Satellites provide certain signals for positioning, timing & navigation applications
  - ➤ Signals picked up individually & used as such …
  - ... Or picked up & assembled & integrated into full-package services by value-added service providers
  - ➔ Tutorial bridges the gap between upstream satellite systems & downstream services
  - ... *As focused on liability issues*

Scope tutorial (2)

- **Comprehensive approach**
  - Main technological, operational, economic, commercial, political, legal & institutional aspects
  - Not only in their essentials as such …
  - … But also in their interaction:
    - Technical & operational aspects may lead to specific liabilities – as dependent on applicable regime(s)
    - Institutional & political frameworks may affect business opportunities as to how liabilities have to be handled
    - Economic & commercial opportunities may drive legal & institutional considerations on liabilities & regimes to be developed therefore

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The programme – 6 May

- 09:00 - 09:30   Welcome
- 09:30 - 10:30   **Module 1: Introduction**
- 10:30 - 11:00   Coffee
- 11:00 - 12:30   **Module 2: Overview Satellite Navigation Systems**
- 12:30 - 14:00   Lunch Break
- 14:00 - 15:30   **Module 3: Architecture applications & services**
- 15:30 - 16:00   Coffee Break
- 16:00 - 17:30   **Module 4: Service & business models**
- 18:00 -   Workshop Diner
- Evening   Preparation of participant cases

Introduction Programme

Module 2

Overview satellite navigation systems

- Tutor: Frans von der Dunk

- A full overview of the mechanics of satellite navigation systems will be provided, introducing the principles of satellite navigation. The major Global Navigation Satellite Systems (GNSS), e.g. GPS, GLONASS, Galileo and augmentation systems will be introduced. The signal services of these systems, which are relevant for the applications and services, will be introduced, including their main characteristics.

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Module 3

Architecture applications & services

➤ Tutor: Rob Postema

➤ Based on the signal services of the GNSS, applications and services can be developed. This block will introduce the technical architecture(s) needed for GNSS based applications and services, dependent of on the type of application or services. The block will identify the main architecture elements needed, and will introduce examples of the different architecture elements, focussing on the GNSS receiver and terminal.

➤ This module will also introduce a back office architecture, which will allow for support of more than one application or service.

Module 4

Service & business models downstream applications & services

- Tutor: Rob Postema

- GNSS based applications and services include a number of stakeholders to be introduced, both in the service and in the business model.

- Framework for a business model (to support users to obtain financing).

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The programme – 7 May

09:00 - 10:30	**Module 5: Institutional & legal framework**
10:30 - 11:00	Coffee Break
11:00 - 12:30	**Module 6: Examples GNSS-based applications services**
12:30 - 14:00	Lunch break & update reference cases
14:00 - 16:00	**Module 7: Presentation & discussion reference cases**
16:00 - 17:00	Wrap-up and conclusion
17:00 -	Drinks

Module 5

Institutional & legal framework GNSS & GNSS-based applications

➢ Tutor: Frans von der Dunk

➢ This module will introduce the governance structures for the development, ownership, operations, marketing and signal provision of the GNSS systems, and will introduce the legal framework in which these GNSS operate.

➢ It will highlight the complex legal relationships between the various key stakeholders, both at the level of GNSS itself and at the level of particular applications, and address such key issues as liabilities, intellectual property rights and market access issues.

Module 6

Examples of GNSS-based applications & services; lessons learned & challenges

➢ Tutors: Rob Postema & Frans von der Dunk

➢ … & mystery guest?

➢ This module will introduce and discuss a number of different applications and services, and discuss these in relation to the earlier blocks. Lessons learned will be introduced and challenges and risks will be discussed.

Module 7

Presentation & discussion reference cases

➢ Moderators: Rob Postema & Frans von der Dunk

➢ Participants will be presented with a handful of reference cases of downstream applications and/or services making use of GNSS, for analysis and discussion within small teams of 2-3 persons. Based on such (internal) analysis and discussion, participants will present towards the end of the course how they would like to introduce the GNSS-based application or service of their specific reference case. All subjects earlier addressed have to be included, and the overall presentations will be discussed with the other teams and tutors.

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Reference cases

Essence: to see & understand interaction upstream-downstream & interaction various aspects in a concrete case

- ➢ Road User Charging
- ➢ Tracking & Tracing of Dangerous Goods
- ➢ Railway Safety
- ➢ Car Insurance
- ➢ ...

Reference materials

Presentations

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Excerpts key legal documents

Questionnaire

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Concluding remarks

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