



ISTITUTO SUPERIORE MARIO BOELLA

THE NAVIS CENTRE

A BRIDGE BETWEEN SOUTH EAST ASIA AND EUROPE IN THE FIELD OF GNSS

Istituto Superiore Mario Boella

ICG-9 – WG C | Prague, 11th November 2014

Gabriella POVERO

navis International Collaboration Centre

for R&D on Satellite Navigation Technology in South East Asia

"The mission of Navis is to boost the R&D of satellite navigation technology, especially the European Galileo System, in South-East Asia."

http://navis.hust.edu.vn

ĐẠI HỌC BÁCH KHOA

UPC

POLITECNICO DI TORINO 1859 1906

ISMB Istituto Superiore Mario Boella

navis International Collaboration Centre for R&D on Satellite Navigation Technology in South East Asia

Long Term Mission

- To promote **research, training, education,** and **technology transfer** in GNSS in **South East Asia.**
- To act as **linking entity** between Europe and South-East Asia in GNSS related activities.
- To facilitate **joint initiatives** between European and South-East Asian institutions in the GNSS field.

"The mission of Navis is to boost the R&D of satellite navigation technology, especially the European Galileo System, in South-East Asia."

MILESTONES

- **2005 – 2007: JEAGAL** *(Joint European-Asian educational and application development programme on GALileo)* project funded by EC to provide:
  - Two technical training courses on GNSS technologies
  - 4 scholarships for HUST staff to follow the Master Program in Navigation and Related Applications at Politecnico di Torino, Italy.
  - Establishment of Galileo Laboratory

- **2009 – 2010: SEAGAL** *(South- East Asia centre on European GNSS for international cooperation And Local development)* project, funded by FP7 to design and set up Navis Centre
- **October 1st, 2010:** Navis Centre was inaugurated

GROWING NAVIS

- **Galileo.2011.4.3-1 : International Activities**
- Partners:
    1. Istituto Superiore Mario Boella – Italy (coordinator)
    2. Politecnico di Torino – Italy
    3. Universidad Politecnica de Catalunya – Spain
    4. Université de Franche-Comté – France
    5. Universitaet der Bundeswehr Muenchen - Germany
    6. Hanoi University of Technology – Vietnam
    7. Asian Institute of Technology – Thailand
    8. National Science and Technology Development Agency – Thailand
    9. Agensi Angkasa Negara - Malaysia
    10. University of New South Wales - Australia
- Duration: 36 months (15th March 2012 – 14th March 2015)

European GNSS Agency

SEVENTH FRAMEWORK PROGRAMME

GROWING NAVIS OBJECTIVES

G-NAVIS is contributing to the growth of the **NAVIS Collaboration Centre** supporting in particular those actions that:

- Enhance its **technical and research capabilities** so that it can be recognized as a valid research and innovation centre
- Extend its **links in South East Asia** with a particular focus on the ASEAN Member States
- Strengthen its **cooperation with Europe**, European institutions and possibly European companies

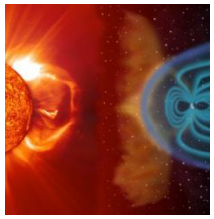
GROWING NAVIS ACTIVITIES

G-NAVIS activities are organised in three parallel lines:

- **Research** - to enhance the technical and research capability of the Centre.
- **Education and Training** - to enforce the availability in the Region of researchers and technicians with a good education in GNSS topics.
- **Dissemination and Networking** - to extend the cooperation of the consortium to key actors in the SEA region and to strengthen its cooperation with EU.

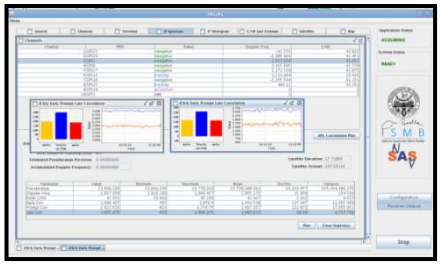
GROWING NAVIS
RESEARCH ACTIVITIES

Three research topics :



Study of **ionosphere characteristics** to be applied to Precise Positioning algorithms

Analysis of algorithms for **software**
Multi-GNSS receivers – RAIM/ARAIM



Study of GNSS integration in **Intelligent Transportation Systems**

GROWING NAVIS
EDUCATION AND TRAINING

A one-week Summer School entitled "**Multi-GNSS environment for sustainable development**" was organized in Hoi An, Vietnam, 8th-13th September 2013.

The School was attended by researchers, technicians, PhD students, public decision makers.

- 6 visiting researchers
- 3 PhDs
- 6 students at Specialising Master on Navigation

GROWING NAVIS DISSEMINATION

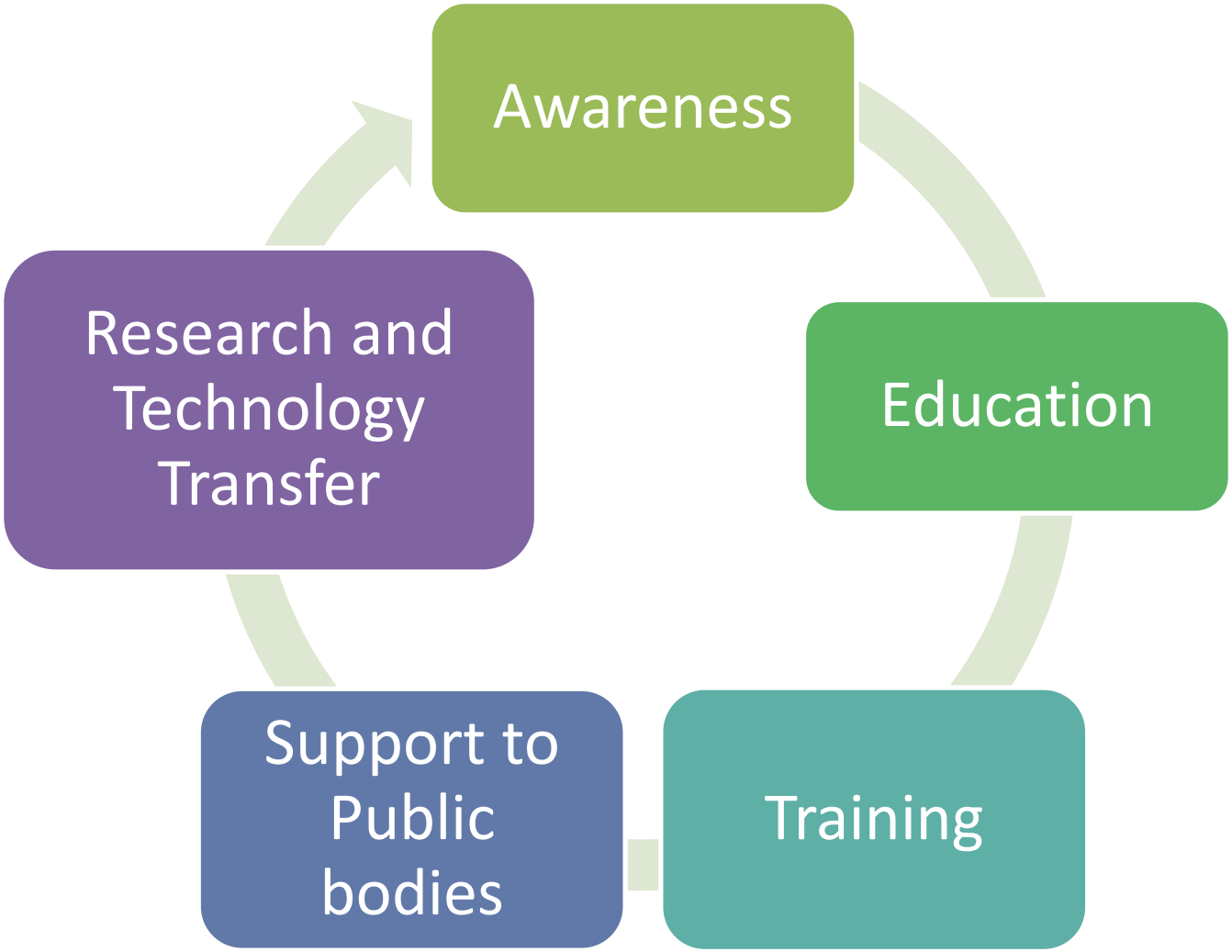
Malaysia, Kuala Lumpur, 8th-11th December 2012
Co-organized with the 4th Asia Oceania Regional Workshop on GNSS

Vietnam, Hanoi, 1st-3rd December 2013
Co-organized with the 5th Asia Oceania Regional Workshop on GNSS

Thailand, Phuket, 9th-11th October 2014
Co-organized with the 6th Asia Oceania Regional Workshop on GNSS


navIS

ACTIVITIES


Awareness
Education
Training
Support to Public bodies
Research and Technology Transfer

THE NUMBERS OF THE navis CENTRE

- 1 Director from Vietnam and 1 Co-Director from Europe;
- Scientific committee with 7 international experts;
- 4 Supporting institutions;
- 18 Researchers;
- 9 international workshops and conferences co-organized in the last thee years;
- 55 papers (2013). 11 co-authored with researchers of foreign institutions

RESEARCH TOPICS IN THE navis CENTRE

In the NAVIS Centre several research lines are developed:

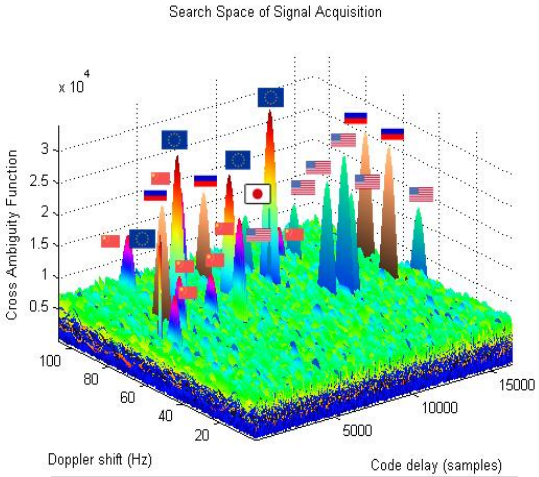
- Advanced satellite navigation signal processing
- Multi-GNSS receiver design (GPS, Galileo, QZSS, Glonass, Beidou)
- Precise positioning techniques and algorithms
- Integration of GNSS and INS
- GNSS based services and applications
- Atmosphere/Ionosphere monitoring

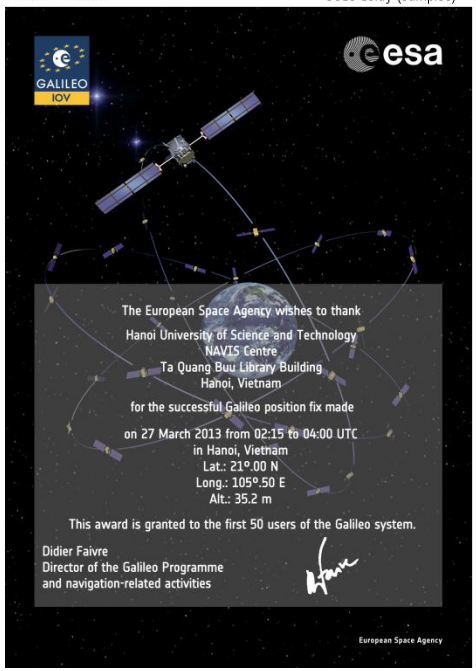
SOME ACHIEVEMENTS

Within these research lines:

- A software receiver, that can track up to 24 satellites, has been developed. It allowed NAVIS researchers to be one of the first 50 research groups in the world computing the position using only the Galileo satellite signals.

- A first prototype (NAVIS-A) of a low cost-high accuracy receiver consisting of a base station (for correction determination) and a rover (for conducting actual measurements) has also been developed. This system allows for an accuracy of few centimeters.





SOME ACHIEVEMENTS

The Centre has also important collaborations with:

- **JAXA** (Japan Aerospace Exploration Agency). NAVIS is running a monitoring station for the QZSS. In 2014 also the experiment "WRTK test in Vietnam".
- **ESA** (European Space Agency). The NAVIS ran a GNSS receiver for ESA.

- **JRC-IPSC** (The Institute for the Protection and Security of the Citizen of the European Commission Joint Research Centre). NAVIS is cooperating to monitor ionosphere scintillation events.
- Consultants on GNSS applications for Vietnamese government.
- Experts on GNSS in ASEAN SCOSA.

CONCLUSIONS

- The NAVIS has achieved good scientific results in a very short period of activity
- Good links with SEA Ministries and Institutions
- Some effort still needed to make the Centre a real hub for European activities in SEA region
- The NAVIS and its European partners are keen to serve to strengthen the links between South East Asia and Europe (but not only . . .)

CONTACTS

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