ITSNT
Toulouse

NOV
14/17
2017

International
Technical Symposium
on Navigation and Timing

At the **Ecole Nationale de l'Aviation Civile** in **Toulouse, France**

Programme

Ecole Nationale de l'Aviation Civile
7 Avenue Edouard Belin CS 54004 – 31055 Toulouse Cedex 4

ITSNT TUTORIALS **

TUESDAY NOV. 14TH 2017
14:00 - 17:30

TUTORIAL 1

GNSS CHALLENGES, PERFORMANCE, AUGMENTATION AND ALTERNATIVES IN URBAN ENVIRONMENTS

Prof. Gérard Lachapelle
University of Calgary, Canada

Outline

→ GNSS Performance in degraded environments
→ Replacement and Aiding Sensors
→ Vehicular Navigation Sensors

TUTORIAL 2

3D VISION: CAMERA MOTION AND SCENE STRUCTURE FROM MULTIPLE VIEWS

Assoc. Prof. Javier Civera
University of Zaragoza, Spain

Outline

→ Camera Geometry
→ Two view Geometry
→ Stereo
→ N-view Computational Methods
→ Camera Tracking and SLAM
→ Software tools and practical example
→ Limitations and future directions.

(**) : Registration Fee: 200€

WEDNESDAY NOV. 15TH

Time	
08:00 - 08:45	REGISTRATION
08:45 - 08:55	OPENING OF ITSNT 2017
09:00– 09:30	KEYNOTE OPENING SPEECH: SATELLITE NAVIGATION AND IONOSPHERE MONITORING: TURNING A THREAT INTO SIGNALS-OF-OPPORTUNITY Prof. Jade Morton University of Colorado at Boulder, USA
09:30 - 10:00	Coffee Break

INVITED GUESTS SESSION 1: "SYSTEMS AND ALGORITHMS" - Bellonte Amphi	
10:00 - 10:30	GNSS CARRIER PHASE POSITIONING: PERFORMANCE AND LIMITATIONS Prof. Gérard Lachapelle University of Calgary, Canada
10:35 - 11:05	GALILEO SYSTEM AND SIGNAL EVOLUTION Stefan Wallner ESA, The Netherlands
11:10 - 11:40	ROBUST AND SECURE PERCEPTION FOR AUTOMATED VEHICLES Prof. Todd Humphreys University of Texas at Austin, USA
11:45 - 12:30	PANEL DISCUSSION WITH ALL SESSION SPEAKERS
12:30 - 14:00	Lunch

Time	«Peer Reviewed Papers» Session 1: Advanced GNSS Integrity - Bellonte Amphi	«Young researchers» Session : Navigation for Robots and Drones - Costes Amphi
14:00 - 14:25	IN DEPTH CHARACTERIZATION OF EGNOS GROUND STATIONS RESPONSE TO SPACE WEATHER DISTURBANCES Ridha Chaggara ESSP , France	DYNAMIC INTEGRITY ALLOCATION FOR DIFFERENT GRADES OF IMU SENSORS TO SUPPORT MULTI-SENSOR INTEGRATED LOCAL-AREA DIFFERENTIAL GNSS FOR UAV APPLICATIONS Jinsil Lee KAIST, South Korea
14:30 - 14:55	SBAS DFMC PERFORMANCE ANALYSIS WITH THE SBAS DFMC SERVICE VOLUME SOFTWARE PROTOTYPE (DSVP) Daniel Salos Egis Avia , France	VISUAL SLAM CONTRIBUTION IN A MULTI-SENSOR FUSION ARCHITECTURE FOR LAND VEHICLE NAVIGATION Amani Ben Afia ENAC, France
15:00 - 15:25	FROM THE PSEUDO-RANGE OVERBOUNDING TO THE INTEGRITY RISK OVERBOUNDING Igor Nikiforov Troyes University of Technology, France	ARDEA : AN MAV FOR AUTONOMOUS NAVIGATION IN UNSTRUCTURED, UNKNOWN, GPS-DENIED ENVIRONMENT Marcus Müller DLR, Germany
15:25 - 16:00	Coffee Break	
16:00 - 16:25	A DEMONSTRATOR TO PROVE ARAIM CONCEPT Daniel Salos Egis Avia, France	TOWARDS AUTONOMOUS PLANETARY EXPLORATION: COLLABORATIVE MULTI-ROBOT LOCALIZATION AND MAPPING IN GPS-DENIED ENVIRONMENTS Martin Schuster DLR, Germany
16:30 - 16:55	INTEGRITY RISK EVALUATION FOR GPS/GLONASS RAIM WITH MULTIPLE FAULTS Eugene Bang ENAC, France	
17:00 - 18:00	Cocktail	

THURSDAY NOV. 16TH

	INVITED GUESTS SESSION 2: "AIR NAVIGATION" - Bellonte Amphi
09:00– 09:30	**15 YEARS OF EXPERIENCE OF GNSS APPROACHES PROCEDURES IMPLEMENTATION AT WORLDWIDE LEVEL, WHERE ARE WE NOW, AND WHAT ARE THE CHALLENGES FROM NOW ON TO 2030** Dr. Benoit Roturier DSNA, France
09:35 - 10:05	**ASSURED NAVIGATION OF UAS IN CHALLENGING ENVIRONMENTS** Prof. Maarten Uijt de Haag Ohio University, USA
10:05 - 10:35	Coffee Break
10:35 - 11:05	**LOCAL AREA DGNSS FOR UAV NAVIGATION** Assoc. Prof. Jiyun Lee KAIST, South Korea
11:10 - 11:40	**ARAIM FAULT DETECTION AND EXCLUSION** Prof. Boris Pervan Illinois Institute of Technology, USA
11:45 - 12:30	**PANEL DISCUSSION WITH ALL SESSION SPEAKERS**
12:30 - 14:00	Lunch

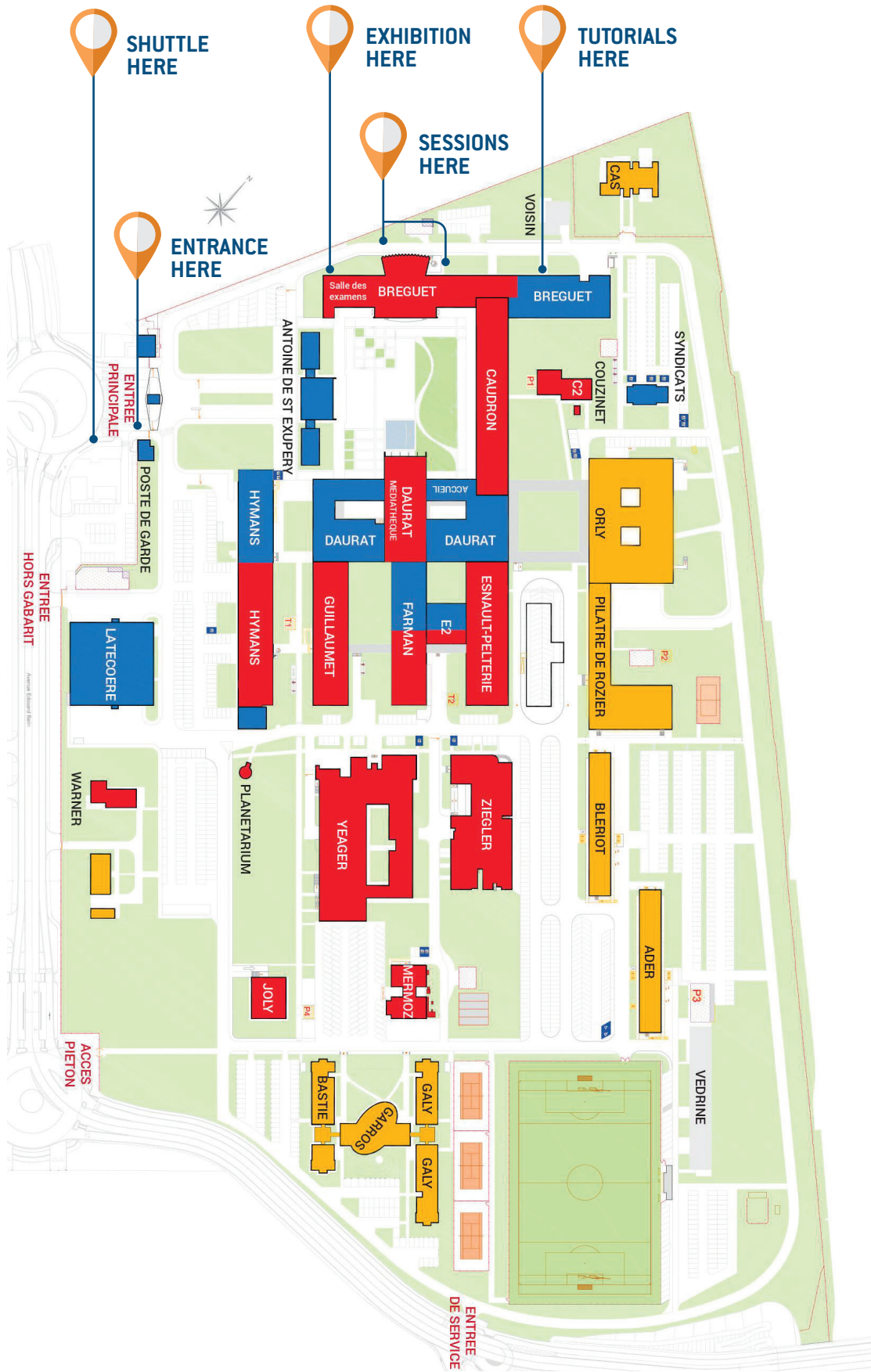|	«Peer Reviewed Papers» Sessions 2 : GNSS Resilience - Bellonte Amphi	«Peer Reviewed Papers» Sessions 3 : Improved Navigation Algorithm - Costes Amphi
14:00 - 14:25	**COMPARISON OF LOW COMPLEXITY C/NO ESTIMATORS FOR GNSS SIGNALS AFFECTED BY IONOSPHERIC SCINTILLATION** José Marçal University of Lisbon, Portugal	**MULTI - ANTENNA GNSS AND INS/ODOMETER COUPLING FOR ROBUST VEHICULAR NAVIGATION** Ali Broumandan University of Calgary, Canada
14:30 - 14:55	**DUAL – CONSTELLATION VECTOR TRACKING ALGORITHM IN LONOSPHERE AND MULTIPATH CONDITIONS** Enik Shytermeja ENAC, France	**ASSESSMENT OF NEW TRACKING ARCHITECTURES FOR FUTURE GNSS RECEIVERS IN HARSH ENVIRONMENTS** Mathilde Dufour Altran Sud, France
15:00 - 15:25	**PERFORMANCE EVALUATION OF SIGNAL QUALITY MONITORING TECHNIQUES FOR GNSS MULTIPATH DETECTION** Ali Pirsiavash University of Calgary, Canada	**CYCLE – SLIP DETECTION AND REPAIR USING A LOW COST SINGLE FREQUENCY RECEIVER WITH INERTIALAIDING** Yu Wang ENAC, France
15:25 - 16:00	Coffee Break	
16:00 - 16:25	**ON THE USE OF LOW - COST INERTIAL MEASUREMENT UNITS FOR AUTONOMOUS SPOOFING DETECTION IN VEHICULAR APPLICATIONS** James Curran ESA, The Netherlands	**POSITION MATCHING ESTIMATION USING 3D SIMULATOR FOR GNSS POSITIONING IN MULTIPATH/NON - LINE - OF - SIGHT ENVIRONMENTS** Nabil Kbayer ISAE-SUPAERO, France
16:30 - 16:55	**INFLUENCE OF GNSS SPOOFING ON DRONE IN AUTOMATIC FLIGHT MODE** Alexandre Vervisch Picois Telecom Sud – Paris Institut Mines Telecom , France	**NAVIGATION SATELLITE FAULT DETECTION AND FAILURE CAUSE IDENTIFICATION METHODS USING INTER - SATELLITE LINKS AND TRIGONOMETRY LAW** Jang JinHyeok Konkuk University, South Korea
17:00 - 17:25	**GNSS SPOOFING DETECTION IN COVERED SPOOFING ATTACK USING ANTENNA ARRAY** Ali Broumandan University of Calgary, Canada	**WORST IMPACT OF PSEUDORANGE NOMINAL BIAS ON THE POSITION IN A CIVIL AVIATION CONTEXT** Jean-Baptiste Pagot ENAC, France

FRIDAY NOV. 17TH

	INVITED GUESTS SESSION 3: "TERRESTRIAL NAVIGATION" - Bellonte Amphi	
09:00– 09:30	**THE ROLE OF GNSS ON INTELLIGENT TRANSPORT SYSTEMS** Assoc. Prof. Nobuaki Kubo **Tokyo University of Marine Science and Technology, Japan**	
09:35 - 10:05	**RESILIENCE OF PNT** Ignacio Fernandez Hernandez **European Commission**	
10:05 - 10:35	Coffee Break	
10:35 - 11:05	**VISION FOR MOTION ALGORITHMS** Assoc. Prof. Javier Civera **SLAM Lab, Robotics, Perception and Real-Time Group, University of Zaragoza, Spain**	
11:10 - 11:40	**PERCEPTION AND COGNITION FOR NAVIGATION OF ROBOT SYSTEMS** Dr. Rudolph Triebel **Department of Perception and Cognition, DLR, Germany**	
11:45 - 12:30	**PANEL DISCUSSION WITH ALL SESSION SPEAKERS**	
	Closing of ITSNT 2017	

	ALTERNATES TO "PEER REVIEWED PAPERS" SESSIONS
Advanced GNSS Integrity	**MODELLING EGNOS ORBIT AND CLOCK CORRECTIONS RESIDUALS** Quentin Tessier **ENAC, France**
GNSS Resilience	**ALTERNATE 1: THALES TOPALERT SOLUTION FOR JAMMER DETECTION AND LOCALIZATION** Audrey Guilloton **Thales Avionics, France**
	ALTERNATE 2: USING OF COLLECTIVE DETECTION FOR GNSS SIGNALS AUTHENTICATION Nicolas Bouny **M3 Systems, France**
Improved Navigation Algorithm	**FRAMEWORK AND PERFORMANCE EVALUATION OF A RAY TRACING - SOFTWARE DEFINED RADIO METHOD FOR GNSS POSITIONING IN AN URBAN CANYON ENVIRONMENT** Rei Furukawa **Tokyo University of Marine Science and Technology, Japan**

MAP

SHUTTLE HERE

EXHIBITION HERE

TUTORIALS HERE

SESSIONS HERE

ENTRANCE HERE

CAS

VOISIN

ENTREE PRINCIPALE

Salle des examens

BREGUET

BREGUET

SYNDICATS

ANTOINE DE ST EXUPERY

POSTE DE GARDE

CAUDRON

P1

C2

COUZINET

DAURAT MÉDIATHÈQUE

ACCUEIL

ORLY

ENTREE HORS GABARIT

HYMANS

DAURAT

DAURAT

Avenue Edouard Belin

LATECOERE

HYMANS

GUILLAUMET

FARMAN

E2

ESNAULT-PELTERIE

PILATRE DE ROZIER

P2

T1

T2

WARNER

PLANETARIUM

YEAGER

ZIEGLER

BLERIOT

ADER

JOLY

P4

MERMOZ

P3

ACCES PIETON

BASTIE

GARROS

GALY

GALY

VEDRINE

ENTREE DE SERVICE

PRACTICAL INFORMATION

Shuttle Time Table

→ **15/11** 07:45: Toulouse Downtown[1] → ENAC[2]
→ **15/11** 18:00: ENAC[2] → Toulouse Downtown[1]
→ **16/11** 08:00: Toulouse Downtown[1] → ENAC[2]
→ **16/11** 18:00: ENAC[2] → Toulouse Downtown[1]
→ **17/11** 08:00: Toulouse Downtown[1] → ENAC[2]

[1] **Toulouse Downtown:** 36 Allée Jean Jaurès, Toulouse
[2] **ENAC:** 7 Avenue Edouard Belin, Toulouse

Internet Access

→ Connect to « ENAC_Public »
→ Your browser should open automatically
→ Create an account
→ Connect using the access code you received by text message (SMS)

Going to the Airport

→ If you need to catch a flight and you're in a hurry, the best way is to call a Taxi (between 20 and 40min ride depending on traffic, price around 45 €)

→ If you have some time before your flight, you can take public transportations: Bus + Metro Line B + Tram T2 (about 1 hour ride)

INTERNATIONAL TECHNICAL SYMPOSIUM ON NAVIGATION AND TIMING

14-17 NOV 2017

ORGANIZERS

GOLD PARTNERS

SILVER PARTNERS

BRONZE PARTNERS

LABELS

LOCAL PARTNER

@ENACFRANCE #ITSNT2017

FOR MORE INFORMATION
Visit www.itsnt.fr
Contact itsnt@recherche.enac.fr
Or Call Sara BOUTERFAS
+33 5 62 17 42 76