ICL-GNSS 2021, June 1-3, 2021

AGENDA

All times are in EEST (GMT+3)

Tuesday, June 1, 2021

10:00am - 10:20am ***Opening***

Session Chair: Jari Nurmi, Tampere University

10:20am - 11:00am ***Localization 1***

Session Chair: Joaquín Torres-Sospedra, Universitat Jaume I

10:20 WALLSY: The UWB and SmartMesh IP enabled Wireless Ad-hoc Low-power Localization SYstem
Sabin C Gheorghiu, Rene H Molnar, Kazmer Nagy-Betegh, Ryan C Grammenos
University College London, United Kingdom

10:40 Outdoor Ranging and Positioning based on LoRa Modulation
Pascal Müller[1], Hannes Stoll[1], Luciano Sarperi[1], Christof Schüpbach[2]
1) ZHAW School of Engineering, Switzerland
2) armasuisse Science + Technology, Switzerland

11:00am - 12:00pm ***Keynote: Eda Marchetti***, Centro Competenza Cybersecurity Toscano

Session Chair: Joaquín Torres-Sospedra, Universitat Jaume I

12:00pm - 12:20pm Break

12:20pm - 1:40pm ***GNSS1***

Session Chair: Heidi Kuusniemi, University of Vaasa

12:20 Efficient Multi-Hypothesis Tests for Extended Coherent Acquisition Using Modified Linear Feedback Shift Register Secondary Codes
J. Rossouw van der Merwe[1], Heike Dorner[1], Xabier Zubizarreta[2], Alexander Rügamer[1], Ivana Lukcin[1], Daniel Rubino[1], Wolfgang Felber[1]
1) Fraunhofer IIS, Germany; 2) ALOR Tech, Spain

12:40 Performance Limits and Benefits of Adaptive Autoregressive Kalman Filters for GNSS Scintillation-Robust Carrier Tracking
Sergi Locubiche-Serra, Gonzalo Seco-Granados, José A. López-Salcedo
Universitat Autònoma de Barcelona (UAB), IEEC-CERES, Spain

13:00 Adaptive Techniques in Scalar Tracking Loops with Direct-State Kalman-Filter
Iñigo Cortés[1], Pablo Marín[1], Johannes Roussouw van der Merwe[1], Elena Simona Lohan[2], Jari Nurmi[2], Wolfgang Felber[1]
1) Fraunhofer IIS, Germany; 2) Tampere University, TAU, Finland

13:20 Sub-Band AGC-Based Interference Mitigation
Fabio Garzia, J. Rossouw van der Merwe, Alexander Rügamer, Santiago Urquijo, Simon Taschke, Wolfgang Felber
Fraunhofer IIS, Nordostpark 84, Nuremberg, Germany

1:40pm - 3:00pm Exhibit break and lunch

3:00pm - 4:00pm ***5G***

Session Chair: Aleksandr Ometov, Tampere University

15:00 Neural Network Fingerprinting and GNSS Data Fusion for Improved Localization in 5G
Roman Klus, Jukka Talvitie, Mikko Valkama
Tampere University, Finland

15:20 5G Positioning Based on the Wideband Electromagnetic Vector Antenna
Bo Sun[1], Bo Tan[1], Wenbo Wang[1], Mikko Valkama[1], Christophe Morlaas[2], Elena Simona Lohan[1]
1) Tampere University, Finland; 2) ENAC, France

15:40 A combined Ray Tracing simulation environment for hybrid 5G and GNSS positioning
Ivana Lukcin[1], Phuong Bich Duong[1], Katrin Dietmayer[1], Sheikh Usman Ali[2], Sebastian Kram[1], Jochen Seitz[1], Wolfgang Felber[1]
1) Fraunhofer IIS, Germany; 2) Technische Universität München (TUM), Germany

4:00pm - 4:20pm Break

4:20pm - 5:00pm ***SS Collaborative positioning***

Session Chair: Alex Minetto, Politecnico di Torino

Session Chair: Jordi Vilà-Valls, ISAE-SUPAERO/University of Toulouse

16:20 Smartphone Distance Estimation Based on RSSI-Fuzzy Classification Approach
Pavel Pascacio[1,2], Sven Casteleyn[1], Joaquín Torres-Sospedra[3]
1) Universitat Jaume I, Spain; 2) Tampere University, Finland; 3) UBIK Geospatial Solutions S.L., Spain

16:40 A Multidimensional Scaling Approach for Seamless Indoor/Outdoor Cooperative GNSS Navigation
Ali Naouri[1], Lorenzo Ortega[2], Jordi Vilà-Valls[1], Eric Chaumette[1]
1) ISAE-SUPAERO/University of Toulouse, France; 2) TéSA, France

Wednesday, June 2, 2021

10:00am - 11:00am ***Antennas***

Session Chair: Sarang Thombre, FGI

10:00 Multibeam antenna array and software switching for low-complexity low-cost GNSS beamforming
Nabanita Sengupta[1], J. Rossouw van der Merwe[1], Alexander Koelpin[2], Alexander Ruegamer[1], Matthias Kuhl[2], Wolfgang Felber[1]
1) Fraunhofer IIS, Germany
2) 2) Hamburg University of Technology, TUHH, Hamburg, Germany

10:20 MAGICA project: Development of a Multi-frequency Automotive GNSS Integrated Cost effective Antenna
Evgenii Filatov[1], Marco Antonio Vélez[1], Joan Gemio[1], Jose Javier Vicente[1], Roser Capdevila[1], Laura Tantinyà[1], Alberto Gil[2], Adrián Cardalda[3], Daniel Baños[1], Pere Mogas[1], Joaquín Reyes[4]
1) FICOSA International; 2) SEAT; 3) Rohde & Schwarz GmbH & Co; 4) GSA

10:40 Algorithm for direction finding using spinning and omnidirectional antennas that uses all available information
Matti Raitoharju
Patria, Finland

11:00am - 12:00pm ***Keynote: Cyril Botteron***, SpacePNT

Session Chair: Simona Lohan, TAU

12:00pm - 12:20pm Break

12:20pm - 1:40pm ***Localization 2***

Session Chair: Joaquín Torres-Sospedra, Universitat Jaume I

12:20 Feasibility of Standalone TDoA-based Localization Using LoRaWAN
Ruthwik Muppala[1], Abhinav Navnit[1], Deeksha Devendra[1], Eustachio Roberto Matera[2], Nicola Accettura[3], Aftab M. Hussain[1]
1) PATRIoT Lab, IIIT Hyderabad, India
2) 2) Abbia GNSS Technologies, Toulouse, France
3) 3) LAAS-CNRS, Universite de Toulouse, CNRS, Toulouse, France

12:40 Comparison of I/Q- and Magnitude-based UWB Channel Impulse Responses for Device-free Localization
Marco Cimdins[1], Sven Ole Schmidt[1], Horst Hellbrück[1,2]
1) Technische Hochschule Lübeck, Germany; 2) University of Luebeck, Germany

13:00 Locating the source in wireless sensor networks with unknown start transmission time
Huijie Zhu[1], Sheng Liu[2], Wei Xu[3], Zhiqiang Yao[4], Zheng Peng[2]

1) Science and Technology on Communication Information Security Control Laboratory, No. 36 Research Institute of China Electronics Technology Group Corporation
2) School of Mathematics and Computational Science of Xiangtan University
3) Changsha Technology Research Institute of Beidou Industry Safety
4) School of Automation and Electronic Information of Xiangtan University

13:20 Towards state-full positioning of mobile subscribers through advanced cellcoverage modeling technique
Artjom Lind, Amnir Hadachi
ITS Lab, Institute of Computer Science, University of Tartu, Estonia

1:40pm - 3:00pm Exhibit break and lunch

3:00pm - 4:20pm ***GNSS2***

Session Chair: Heidi Kuusniemi, University of Vaasa

15:00 Message-to-Satellite Allocation Strategies for Long GNSS Messages and application to the Galileo High Accuracy Service
Tommaso Senni[1], Ignacio Fernàndez-Hernàndez[2], Simòn Cancela[3]
1) RHEA group for European Commission, Netherlands; 2) European Commission, Brussels; 3) GMV, Madrid

15:20 Are Elliptical Galileo Satellites Usable for RTK?
Andrew Simsky, Dries Schellekens
Septentrio N.V., Belgium

15:40 Machine Learning Utilization in GNSS—Use Cases, Challenges and Future Applications
Akpojoto Siemuri, Heidi Kuusniemi, Mohammed S. Elmusrati, Petri Välisuo, Ahm Shamsuzzoha
University of Vaasa, Finland

16:00 Galileo performance assessment for aerial navigation
José Alberto Gonçalves[1,2], Américo Magalhães[1], Luisa Bastos[1,2]
1) University of Porto - Science Faculty, Portugal
2) CIIMAR - Interdisciplinary Centre of Marine and Environmental Research

4:20pm - 4:40pm Break

4:40pm - 5:20pm ***SS Smartphone positioning***

Session Chair: Vincenzo Di Pietra, Politecnico di Torino

Session Chair: Paolo Dabove, Politecnico di Torino

16:40 SmartCoop Algorithm: Improving Smartphones Position Accuracy and Reliability through Collaborative Positioning
Thomas Verheyde[1], Antoine Blais[2], Christophe Macabiau[2], François-Xavier Marmet[3]

1) TéSA Research Laboratory; 2) ENAC, Université de Toulouse.; 3) CNES, Centre National d'Etudes Spatiales

17:00 Assessing Galileo positioning using a smartphone in an airborne platform
Américo da Silva Magalhães, José Alberto Gonçalves, Luísa Bastos
Faculty of Sciences, University of Porto, Portugal

Thursday, June 3, 2021

10:00am - 11:00am ***SS GNSS assessment 1***

Session Chair: Peter Buist, European GNSS Agency (GSA)

Session Chair: Hillar Tork, European Commission (DG/DEFIS)

10:00 Interoperability of GNSSs for Position, Velocity and Timing
Alessandro Caporali, Joaquin Zurutuza
University of Padova, Italy

10:20 Analysis of Galileo NeQuick ionospheric model based on the station position error
Anna Świątek, Leszek Jaworski, Paulina Woźniak
Space Research Centre, Polish Academy of Sciences, Warsaw, Poland

10:40 Performance testing and runtime optimisation of an independent NeQuick-G implementation
Nikki de Kleer, Hein Zelle
NLR (Netherlands Aerospace Centre), the Netherlands

11:00am - 12:00pm ***Keynote: Jari Saarinen***, Sensible4

Session Chair: Simona Lohan, TAU

12:00pm - 12:20pm Break

12:20pm - 1:40pm ***SS GNSS assessment 2***

Session Chair: Peter Buist, European GNSS Agency (GSA)

Session Chair: Hillar Tork, European Commission (DG/DEFIS)

12:20 Galileo OS navigation performance monitoring supported by RIGTC/GOP
Jan Dousa, Pavel Vaclavovic, Michael Kala, Petr Bezdeka, Lewen Zhao
Research Institute of Geodesy, Topography and Cartography, Czech Republic

12:40 Improved velocity estimation in urban areas using Doppler observations
Ankit Jain, Dennis Kulemann, Steffen Schön
Leibniz University Hannover, Germany

13:00 REASON – Resilience and Security of Geospatial Data for Critical Infrastructures

Sanna Kaasalainen[1], Maija Mäkelä[1], Laura Ruotsalainen[2], Titti Malmivirta[2], Thomas Fordell[3], Kalle Hanhijärvi[3], Anders Wallin[3], Thomas Lindvall[3], Sergey Nikolskiy[1], Martta-Kaisa Olkkonen[1], Jesperi Rantanen[1], Sonja Lahtinen[1], Zahidul Bhuiyan[1], Hannu Koivula[1]

1) Finnish Geospatial Research Institute, Finland
2) University of Helsinki, Finland
3) VTT MIKES, Finland

13:20 State of the art of the agriculture professional GNSS receivers
Jacopo Capolicchio[1], Daniele Mennuti[2], Ileana Milani[3], Luigi Villa[4], Joaquin Reyes Gonzalez[5], Martin Sunkevic[5]

1) Thales Alenia Space Italia, Italy; 2) Business Integration Partners, Italy; 3) Randstad Italia, Italy; 4) Akka Italia, Italy; 5) European GNSS Agency (GSA)

1:40pm - 3:00pm Exhibit break and lunch

3:00pm - 4:00pm ***LEO and Filters***

Session Chair: Robert Piché, Tampere University

15:00 A Review on Precise Orbit Determination of Various LEO Satellites
Kannan Selvan, Akpo Siemuri, Heidi Kuusniemi, Petri Välisuo
Digital Economy, University of Vaasa, Finland

15:20 Embedded Tightly Coupled INS/DGPS-DGAL Navigation Filter on a Mass-Market Single-Board Computer
Maximilian Nitsch, Jan-Jöran Gehrt, Lukas Heyn, René Zweigel, Dirk Abel
Institute of Automatic Control, RWTH Aachen University, Aachen

15:40 Kalman filtering with empirical noise models
Matti Raitoharju[1], Henri Nurminen[2], Demet Cilden-Guler[3], Simo Särkkä[1]

1) Aalto University, Espoo, Finland; 2) Here, Tampere, Finland; 3) Faculty of Aeronautics and Astronautics, Istanbul Technical University, Turkey

4:00pm - 4:20pm Break

4:20pm - 5:00pm ***SS Wearable computing***

Session Chair: Aleksandr Ometov, Tampere University

16:20 Development of Smart Shin Guards For Soccer Performance Analysis Based On MEMS Accelerometers, Machine Learning, And GNSS
Karin Mascher, Stefan Laller, Manfred Wieser
Graz University of Technology, Austria

16:40 The transferable methodologies of detection sleep disorders thanks to the actigraphy device for Parkinson's disease detection
Justyna Anna Skibinska[1,2], Radim Burget[1]

1) Brno University of Technology, Czech Republic; 2) Tampere University, Finland

5:00pm - 5:20pm ***Awards and Closing***

Session Chair: Jari Nurmi, Tampere University