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Fraunhofer IIS, Location Nuremberg,
 Positioning and Networks



Ladies and Gentlemen,

welcome to the 9th International Conference on Navigation and GNSS in Nuremberg to consider and discuss reliable navigation and positioning in applications for IoT, in industry and logistic applications, in smart city environments, for safety-critical purposes, in public services and consumer products.

Navigation and positioning are becoming essential when guaranteeing transparent, efficient and reliable workflows. A robust localization solution, which will be available continuously is needed regardless outdoor and indoor, and on different platforms. ICL-GNSS addresses the latest research on wireless and satellite-based positioning techniques to provide reliable and accurate position information with low latency. The emphasis is on the design of mass-market navigation receivers and related tools and methodologies.

During the next three days we will have an intensive look to GNSS technologies and applications, as well as an outlook to 5G technology as enabler for precise and real-time localization.

We wish you a conference with intense and fruitful discussions.

Prof. Dr. Jari Nurmi
 Tampere University of Technology

Prof. Dr. Albert Heuberger
 Fraunhofer IIS

General Chairs:

Jari Nurmi, TUT, Finland; Albert Heuberger, Fraunhofer IIS, Germany

TPC Chairs:

Elena-Simona Lohan, TUT, Finland; Alexander Rügamer, Fraunhofer IIS, Germany; Wolfgang Koch, Fraunhofer FKIE, Germany

Steering Committee:

Jari Nurmi, TUT, Finland; Fabio Dovis, Politecnico di Torino, Italy; Gonzalo Seco Granados, UAB, Spain; Elena-Simona Lohan, TUT, Finland; Jose Lopez-Salcedo, UAB, Spain; Alexander Rügamer, Fraunhofer IIS, Germany; Terry Moore, Nottingham, United Kingdom; Stephan Sand, DLR, Germany; Adriano Moreira, UM, Portugal

MONDAY, 3RD JUNE

17:00 Registration Open
 18:00 Icebreaker Reception

TUESDAY, 4TH JUNE

08:00 Registration Open
 09:00 Conference Opening
 Prof. Dr. Jari Nurmi (Tampere University)
 Prof. Dr. Albert Heuberger (Fraunhofer IIS)

09:30 Keynote
 Prof. Dr. Eissfeller (Bundeswehr University Munich)
 "History and future of high precision GNSS"

10:30 Coffee Break

11:00 Technical Session
 GNSS Technology

11:00 – 11:25 Katrin Dietmeyer, Christian Strobel, Muhammad Saad, Florian Kunzi, Fabio Garzia, Matthias Overbeck, Wolfgang Felber, (Fraunhofer IIS, Germany)
 "Solution for satellite rise and set in a vector delay lock loop on GNSS receiver hardware"

11:25 – 11:50 Jaakko Pihlajasalo, Helena Leppäkoski, Saara Kuismanen, Simo Ali-Löytty, Robert Piché (Tampere University, Finland)
 "Methods for long-term GNSS clock offset prediction"

11:50 – 12:15 Benoit Priot, Arnaud Dion, Guillaume Beaugendre, Raghuvveer Kasaraneni (ISAE-SUPAERO, University of Toulouse, France)
 "Accurate Events Synchronization in a System-on-Chip Navigation Receiver"

12:15 – 12:40 Fabio Garzia, Stefan Egerer, Muhammad Saad, Santiago Urquijo, Alexander Rügamer, Matthias Overbeck, Wolfgang Felber (Fraunhofer IIS, Germany)
 "Multi-GNSS hardware accelerator chip"

12:40 Lunch/ Exhibition Visit

14:00 Technical Session
 Jamming Detection and Mitigation

14:00 – 14:25 Ruben Morales Ferre¹, Philipp Richter¹, Alberto De La Fuente², Elena Simona Lohan¹ (Tampere University, Finland; ²GMV, Spain)
 "In-lab validation of jammer detection and direction finding algorithms for GNSS"

14:25 – 14:50 Micaela Troglia Gamba, Emanuela Falletti (LINKS Foundation, Italy)
 "Performance Comparison of FLL Adaptive Notch Filters to counter GNSS Jamming"

14:50 – 15:15 Amin Hashemi¹, Sarang Thombre¹, Nunzia Giorgia Ferrara¹, Zahidul Bhuiyan¹, Michael Pattinson² (Finnish Geospatial Research Institute, Finland; ²Nottingham Scientific Limited, United Kingdom)
 "STRIKE3-Case Study for Standardized Testing of Timing-grade GNSS Receivers against Real-world Interference Threats"

15:15 – 15:40 Gonzalo Mori Gonzalez¹, Ivan Petrunin², Rafal Zbikowski³, Kimon Voutsis³, Ricardo Verdeguer Moreno³ (Altran Technologies, Toulouse, France; ²Cranfield University, United Kingdom; ³Spirent, Crawley, United Kingdom)
 "Vulnerability analysis of GPS receiver software"

15:40 Coffee Break

16:10 Technical Session
 Interference and Spoofing Countermeasures

16:10 – 16:35 Karen von Huenerbein, Werner Lange (Lange-Electronic GmbH, Germany)
 "Indoor Testing of GPS/GNSS Performance of array antennas with simulated signals from multiple angles of arrival for robust positioning and navigation"

16:35 – 17:00 Johannes Rossouw Van Der Merwe, Alexander Ruegamer, Alejandro Fernandez-Dans Goicoechea, Wolfgang Felber (Fraunhofer IIS, Germany)
 "Blind spoofing detection using a multi-antenna snapshot receiver"

17:00 – 17:25 Silvio Semanjski¹, Ivana Semanjski², Wim De Wilde³, Alain Muls¹ (Royal Military Academy, Belgium; ²Gent University; ³Septentrio N.V.)
 "Use and Validation of Supervised Machine Learning Approach for Detection of GNSS Signal Spoofing"

17:25 End of Technical Session

Evening program
 17:40 Special Guided Tour & Gala Dinner
 Transport Museum Nürnberg
 Bus transfer from Fraunhofer IIS

WEDNESDAY, 5TH JUNE

08:00 Registration Open
 09:15 Welcome 2nd Day
 Dr. Günter Rohmer (Fraunhofer IIS)
 "New possibilities for applications in sports and production"

09:30 Keynote
 Dr. Hahn (European Space Agency – ESA)
 "Future shaped with us – Leading Galileo towards its next decades"

10:30 Coffee Break

11:00 Technical Session
 Industrial Internet of Things (IIOT)

11:00 – 11:25 Maximilian Stahlke², Sebastian Kram¹, Thorbjørn Mummé¹, Jochen Seitz¹ (Fraunhofer IIS, Germany; ²Nuremberg Institute of Technology Georg Simon Ohm)
 "Discrete Positioning using UWB Channel Impulse Responses and Machine Learning"

11:25 – 11:50 Sven Ole Schmidt, Marco Cimmins, Horst Hellbrück (University of Applied Sciences Lübeck, Germany)
 "On the Effective Length of Channel Impulse Responses in UWB Single Anchor Localization"

11:50 – 12:15 Sergey Bezzateev¹, Natalia Voloshina¹, Konstantin Zhidanov², Aleksandr Ometov³ (ITMO University; ²SUAI University; ³Tampere University)
 "Secure Environmental Monitoring for Industrial Internet of Things: from Framework to Live Implementation"

12:15 – 12:40 Octavian Arsene¹, Corina Postelnicu², Wenbo Wang³, Elena Simona Lohan³, Dumitru Iulian Nastac¹ (University Politehnica of Bucharest, Romania; ²IT Center for Science and Technology, Romania; ³Tampere University, Finland)
 "An architecture for indoor location-aided services based on collaborative industrial robotic platforms"

12:40 Lunch/ Exhibition Visit

14:00 Technical Session
 Vehicular Positioning

14:00 – 14:25 Paul Schwarzbach, Paula Tauscher, Albrecht Michler, Oliver Michler (Institute of Traffic Telematics, TU Dresden, Germany)
 "V2X based Probabilistic Cooperative Position Estimation applying GNSS Double Differences"

14:25 – 14:50 Roman Lesjak, Agnes Rita Koller, Manfred Klopschitz, Ulrike Kleb, Gordana Djuras, Richard Ladstädter, Stefan Ladstätter, Matthias Rütther (JOANNEUM RESEARCH, Austria)
 "Low-Cost GNSS Aiding by Visual Odometry, Radar and 3D Maps"

14:50 – 15:15 Martin Schauer, Lucila Patino Studencki, Manuel Kraus, Martin Nippe, Gerhard Pfeiffer, Christian Siller, Christian Pfeuffer (Elektrobit Automotive GmbH, Germany)
 „Distributed position and ego-motion estimation for automotive"

15:15 – 15:40 Martin Schmidhammer, Christian Gentner, Benjamin Siebler (DLR, Germany)
 "Localization of Discrete Mobile Scatterers in Vehicular Environments Using Delay Estimates"

15:40 Coffee Break

16:10 Technical Session
 Errors Mitigation for GNSS High Accuracy Positioning

16:10 – 16:35 Caner Savas, Fabio Dovis (Politecnico di Torino, Italy)
 "Comparative Performance Study of Linear and Gaussian Kernel SVM Implementations for Phase Scintillation Detection"

16:35 End of Technical Session

Evening program
 18:00 Technology BBQ
 Fraunhofer IIS, Nürnberg

THURSDAY, 6TH JUNE

08:00 Registration Open
 09:30 Keynote
 Prof. Dr. Seco (Autonomous University of Barcelona)
 "5G NR Localization"

10:30 Coffee Break

11:00 Technical Session
 5G Positioning

11:00 – 11:25 Andreas Eidloth (Fraunhofer IIS, Germany)
 "The road to precise localization with 5G"

11:25 – 11:50 Florin-Catalin Grec¹, Lionel Ries¹, David Bartlett², José A. del Peral-Rosado³, Enrique Dominguez Tijero⁴, Roberto Prieto-Cerdeira¹, Ronald Raulefs⁵ (ESA, The Netherlands; ²u-blox AG; ³Universitat Autònoma de Barcelona (UAB); ⁴GMV; ⁵DLR)
 "Considerations on GNSS and Hybrid GNSS/ RAT-dependent Positioning in 5G"

11:50 – 12:15 Sven Fischer (Qualcomm, Germany)
 "Positioning in 5G – 3GPP Standardisation Status"

12:15 – 12:40 Sai Krishna Sravan Machiraju, Ernst Phillip Mrohs, Paulo Mendes (NavCert GmbH, Germany)
 "Positioning with GNSS and 5G for EU eCall"

12:40 Lunch/ Exhibition Visit

14:00 Technical Session
 Services and Applications

14:00 – 14:25 Arndt Kadelka (Deutsche Telekom)
 "Positioning as a Service"

14:25 – 14:50 Wenbo Wang, Niloofer Okati, Islam Tanash, Taneli Riihonen, Elena-Simona Lohan (Tampere University, Finland)
 "Location-based Beamforming Architecture for Efficient Farming Applications with Drones"

14:50 – 15:15 Rayan Imam¹, Fabio Dovis¹, Marco Pini², Gianluca Marucco², Fabrizio Dominici² (Politecnico di Torino, Italy; ²Fondazione LINKS)
 "Data from GNSS-based passive radar to support flood monitoring operations"

15:15 – 15:40 Mathias Philips-Blum (Bundeswehr University Munich, Germany)
 "Precise Relative Swarm Navigation"

15:40 Coffee Break

16:00 Technical Session
 Wireless Positioning

16:00 – 16:25 Erik Stare (Ericsson, Sweden)
 "5G Reference Signal Design for Positioning"

16:25 – 16:50 Marco Gunia, Yibo Lu, Niko Joram, Frank Ellinger (TU Dresden, Germany)
 "On the Precision of Common Individual or Hybrid Positioning Systems"

16:50 Awards, ICL-GNSS 2020 and Closing
 Prof. Dr. Jari Nurmi

17:00 End of ICL-GNSS 2019