2017 14th Workshop on Positioning, Navigation and Communications (WPNC 2017)

Bremen, Germany
25 – 26 October 2017

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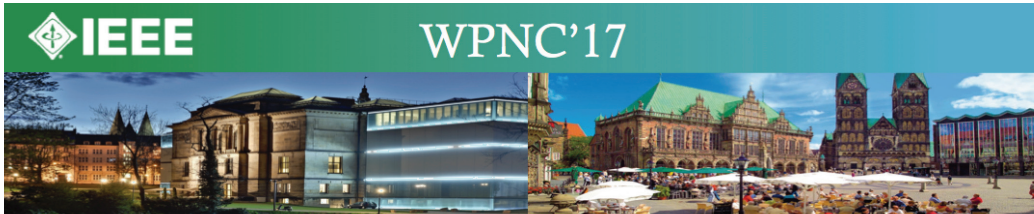
Program

25th October 2017

8:00 - 13:00	**Registration**

9:00 - 9:10 — Opening Speech

"14th IEEE Workshop on Navigation, Positioning and Communication"
Dr. Stefano Severi, TPC Co-Chair, Jacobs University Bremen, Germany, and Dr. Benoit Denis, TPC Co-Chair, CEA-Leti, Grenoble, France.

9:10 - 9:30 — Presentation of the Demo in Smart Indoor Localization

"Imagine how your business becomes real-time transparent. Real-time transparency with pinpoint accuracy".....N/A
Paul Blazer, ZIGPOS GmbH, Dresden

Abstract: "*Identification, localization, and tracking is a basic IoT requirement. ZIGPOS presents a new class of smart IoT devices with positioning capabilities*".

The ZIGPOS demo will run continuously for the 2 days of the conference within the IRC hall. After the presentation you can register at the ZIGPOS booth to try the newest location demo.

9:30 - 9:40 — Welcome Speech

"Mobility 4.0 and WPNC18".....N/A
Prof. Giuseppe Abreu, General Co-Chair, Jacobs University Bremen, Germany and Prof. Sven Zeisberg (video message), General Co-Chair, HTW Dresden, Germany.

9:40 - 10:10 [K1] — Keynote on Electric Vehicle Navigation

"Real-time Integration of E-Mobility data for the implementation of novel energy paradigms".....1

Alfonso Damiano* and Mario Mureddu, University of Cagliari, Italy

Abstract: "*The integration between Electric Mobility (EM) and Power Infrastructures (PIs) is the central concept of the Vehicle to Grid (V2G) paradigm, which is seen as crucial for the upcoming transition towards sustainable energy and mobility.*

The planned adoption of V2G in smart cities foresees the coexistence of two interconnecting layers: a physical layer given by the EM Charging Infrastructure (EMCI), and a virtual layer given by an ICT-based management platform. On one hand, the EMCI will be likely composed by charging stations and Wireless Power Transfer (WPT) systems, allowing a bidirectional power exchange between EM and PI. On the other hand, the virtual layer will be composed by an Energy Management Platform (EMP) aiming to control these bidirectional power flows. This includes the set of sensors needed to bidirectional exchange real-time information with the EV fleet and the CI.

This keynote investigates the state-of-the-art regarding the real-time control of a V2G infrastructure. The aim is to provide information on the V2G control structures proposed in literature, in order to stimulate a cross-field research on the topic".

10:40 - 11:00	Break

11:00 - 12:40	**Technical Session I - Indoor** **5 papers**
11:00 - 11:20 [A1]	**"Indoor Localisation using Aroma Fingerprints: A First Sniff".....6** Philipp Müller*, Tampere University of Technology; Simo Ali-Löytty, Tampere University of Technology; Jukka Lekkala, Tampere University of Technology; Robert Piché, Tampere University of Technology
11:20 - 11:40 [A2]	**"NavApp: An Indoor Navigation Application - A Smartphone Application for Libraries".....11** Iman Abu Hashish*, University of Pavia; Gianmario Motta, University of Pavia; Michela Meazza, University of Pavia; Antonella Longo, University of Salento; Guoqing Bu, University of Pavia; Kaixu Liu, University of Pavia; Lorenzo Duico, University of Pavia
11:40 - 12:00 [A3]	**"A Hybrid Indoor Positioning Solution Based on Wi-Fi, Magnetic Field and Inertial Navigation".....17** Ugur Bolat, Technische Universitaঁt Chemnitz, Mehmet Akcakoca, R&D Department
12:20 - 12:40 [A5]	**"Wi-Fi butterfly effect in indoor localization: The impact of imprecise ground truth and small-scale fading".....23** Andrei Popleteev*, SnT, University of Luxembourg

12:40 - 13:40	Lunch

13:40 - 15:20	**Technical Session II - Algorithms** **5 papers**
13:40 - 14:00 [B1]	**"Coarse Estimation of the Incident Angle for VLP with an Aperture-Based Receiver".....28** Sander Bastiaens, Ghent University; Heidi Steendam*, Ghent University
14:00 - 14:20 [B2]	**"Anchorless Underwater Acoustic Localization".....34** Elizaveta Dubrovinskaya, IMDEA Networks Institute; Roee Diamant, University of Haifa; Paolo Casari*, IMDEA Networks Institute
14:20 - 14:40 [B3]	**"MRC implementation of Super MDS for Efficient 2D Localization".....40** Alireza Ghods*, Jacobs University Bremen, Germany; Stefano Severi, Jacobs University Bremen; Giuseppe Abreu, Jacobs University Bremen
14:40 - 15:00 [B4]	**"Position Estimation with Bayesian Filters by using 3-dimensional Environment Models".....46**

	Christian Schott, Chemnitz University of Technology; Murali Padmanabha, Chemnitz University of Technology; Marko Rößler, Chemnitz University of Technology; Daniel Fross*, Chemnitz University of Technology; Ulrich Heinkel, Chemnitz University of Technology
15:00 - 15:20 [B5]	**"Mobile Target Localization through Low Complexity Compressed Sensing with Iterative Alternate Coordinates Projections".....52** Benoit Denis*, CEA-Leti; Cristian Pana, Jacobs University Bremen; Giuseppe Abreu, Ritsumeikan University /Jacobs University

15:20 - 15:40	**Break**

15:40 - 17:00	**Technical Session III - Radio 1**	**4 papers**

15:40 - 16:00 [C1]	**"Optimal Fractional Non-Coherent Detector for High-Sensitivity GNSS Receivers Robust against Residual Frequency Offset and Unknown Bits".....58** David Gomez-Casco*, UAB; Jose A. Lopez-Salcedo, UAB; Gonzalo Seco-Granados, UAB
16:00 - 16:20 [C2]	**"Power-Based Direction-of-Arrival Estimation Using a Single Multi-Mode Antenna".....63** Robert Pöhlmann*, DLR
16:20 - 16:40 [C3]	**"Localization Bound based Beamforming Optimization for multicarrier mmWave MIMO".....69** Remun Koirala*, CEA-Leti; Benoit Denis, CEA-Leti; Davide Dardari, DEIS-University of Bologna, Italy; Bernard Uguen, University of Rennes 1 - IETR, France
16:40 - 17:00 [C4]	**"Multi-Band Small-Scale Fading Mitigation at UWB Localization Receivers in Dense Multipath Channels".....75** Jimmy MACERAUDI*, CEA-Leti; François DEHMAS, CEA-Leti; Benoit Denis, CEA-Leti; Bernard Uguen, University of Rennes 1 - IETR, France

17:00 - 18:00	**Technical Session IV - Radio 2**	**3 papers**

17:00 - 17:20 [D1]	**"Optimized Waveform for Energy Efficient Ranging".....81** Emanuel Staudinger*, German Aerospace Center (DLR) e.V.; Michael Walter, German Aerospace Center (DLR) e.V.; Armin Dammann, German Aerospace Center (DLR) e.V.
17:20 - 17:40 [D2]	**"Parametric Direction-of-Arrival Estimation for Multi-Mode Antennas".....87** Sami Alkubti Almasri*, Faculty of Engineering, University of Kiel; Niklas Doose, Faculty of Engineering, University of Kiel; Peter A. Hoeher, Faculty of Engineering, University of Kiel
17:40 - 18:00 [D3]	**"Modeling Received Signal Strength and Multipath Propagation Effects of Moving Persons".....92** Marco Cimdins*, Luebeck University of Applied Sciences; Horst Hellbrück, FH Lübeck / Universität zu Lübeck

18:00 - 19:00	**Social Session in Campus**

26th October 2017

8:00 - 10:00	Registration

9:00 - 9:30

Presentation of the demo on Autonomous Driving

"Precise LiDAR-Based Ego-Positioning ".....N/A
Ibeo Automotive Systems GmbH, Hamburg, Germany (www.ibeo-as.com)

Abstract: "*In this demonstration, Ibeo presents its LiDAR-based localization approach which is more precise compared to localization with a standard GPS device. For the demonstration, this localization approach is realized in two steps. The first step is the a priori creation of a map of the area where the demonstration takes place using recorded LiDAR data. In the second step, the localization is performed online during the demonstration drive.*

For the data recording, a vehicle is used which is equipped with up to six LiDAR sensors at bumper height for 360° environmental perception around the vehicle and two LiDAR sensors mounted on a roof rack facing the road surface behind the vehicle to scan road markings. With the recorded data, a map is created which contains static objects as landmarks for the orientation of the vehicle. During the demonstration drive, this LiDAR-based localization approach is compared with possible GPS localization results".

Ibeo Automotive Systems GmbH is partner of the H2020 EU project HIGHTS (Highly accurate localization for C-ITS), see www.hights.eu

NOTE: The demo will be first presented in the main conference hall and then participants will have the possibility to register for a later drive in-campus at the Ibeo booth. On each demo drive we can take up to 3 attendees of the conference. Registration is mandatory.

9:30 - 10:00

Jacobs University Keynote

"Talent Development and Industrial Cooperation with Jacobs University"...N/A
Predrag Tapavicki, Head of Corporate Relations and Talent Management

Mr Tapavicki will bring the salute of the host institution, Jacobs University, and will illustrate the how are designed and how much are successful the activities of talent development and industrial cooperation performed by the university. Particular attention will be paid to the next Career Fair at Jacobs (see link here) and other in-campus talent discovery opportunities.

10:00 - 11:00	Technical Session V - Simulators, Platforms and Experiments 1	3 papers
10:00 - 10:20 [E1]	**"Robot Self-Localization in Ultra-Wideband Large Scale Multi-Node Setups".....98** Reza Zandian*, Fachhochschule Südwestfalen; Ulf Witkowski, Fachhochschule Südwestfalen	

10:20 - 10:40 [E2]	**"A Human-like Walking Gait Simulator for Estimation of Selected Gait Parameters".....104** Mahdi Abid*, IFSTTAR; Valérie Renaudin, IFFSTAR, France; Thomas Robert, IFSTTAR; Yannick Aoustin, LS2N, Ecole centrale de Nantes; Eric Le-Carpentier, LS2N, Ecole centrale de Nantes	
10:40 - 11:00 [E3]	**"An Approach for Implementation of Ranging and Positioning Methods on a Software Defined Radio".....110** Vladica Sark*, IHP GmbH; Nebojsa Maletic, IHP Microelectronics; Jesús Gutiérrez, IHP; Eckhard Grass, IHP, Germany	

11:00 - 11:30	**Break**

11:30 - 12:50	**Technical Session VI - Vehicular 1**	**4 papers**
11:30 - 11:50 [F1]	**"Vehicle Indoor Positioning: A Survey".....N/A** Jens Einsiedler*, FU Berlin; Radusch Ilja, Fraunhofer FOKUS; Katinka Wolter, Free University Berlin	
11:50 - 12:10 [F2]	**"Multiple Hypothesis Data Association for Multipath-Assisted Positioning".....116** Markus Ulmschneider*, German Aerospace Center (DLR)	
12:10 - 12:30 [F3]	**"Performance Limits of V2I Ranging Localization with LTE Networks".....122** José del Peral-Rosado*, Universitat Autònoma de Barcelona; M. Angélica Barreto-Arboleda, Universitat Autònoma de Barcelona; Francesca Zanier, European Space Agency; Gonzalo Seco, UAB; Jose Salcedo, UAB	
12:30 - 12:50 [F4]	**"Multiple Vehicles Based New Landmark Feature Mapping for Highly Autonomous Driving Map".....127** Chansoo Kim*, Hanyang University; Kichun Jo, Valeo; Myoungho Sunwoo, Hanyang University	

12:50 - 13:50	**Lunch**

13:50 - 14:50	**Technical Session VII - Vehicular 2**	**3 papers**
13:50 - 14:10 [F5]	**"Optimal Smoothing Based Mapping Process of Road Surface Marking in Urban Canyon Environment".....133** Chansoo Kim*, Hanyang University; Kichun Jo, Valeo; Myoungho Sunwoo, Hanyang University	
14:10 - 14:30 [F6]	**"5G Signal Design for Road Surveillance".....139** Martin Schmidhammer*, German Aerospace Center (DLR)	
14:30 - 14:50 [F7]	**"Development of a Simulation Tool for Collaborative Navigation Systems".....145** Nicolas Garcia Fernandez*, Institut für Erdmessung - Leibniz Universität Hannover; Steffen Schön, Institut für Erdmessung - Leibniz Universität Hannover	

14:50 - 15:15	**Break**

15:15 - 16:00	**Poster Session**	**6 posters**
[P1]	**"A Graph Localization Approach to Assist a Diver-in-Distress".....151** Roee Diamant*, University of Haifa; Roberto Francescon, University of Padova; Michele Zorzi, University of Padova	
[P2]	**"Requirements to Positioning Solution for Mobility 4.0".....157** Hirofumi Onishi*, Alpine Electronics Research	
[P3]	**"A Test Environment for Phase-Based Ranging and Localization".....163** Yannic Schröder*, Technische Universität Braunschweig; Dennis Reimers, Technische Universität Braunschweig; Lars Wolf, Technische Universität Braunschweig	
[P4]	**"Angle of Arrival Estimation Using Decawave DW1000 Integrated Circuits".....166** Igor Dotlic*, Decawave	
[P5]	**"Synthetic Aperture Radar Algorithm for a Global Amplitude Map".....172**	

	Fabian Harrer*, perisens GmbH
[P6]	**"Comparison of ROS-based Visual SLAM methods in homogeneous indoor environment".....178**
	Ilmir Ibragimov, Innopolis University; Ilya Afanasyev*, Innopolis University

16:00 - 17:00	Technical Session VIII - Simulators, Platforms and Experiments 2	3 papers
16:00 - 16:20 [E4]	**"Setting up a Phase-Based Positioning System using Off-the-Shelf Components".....184** Marco Gunia*, TU Dresden	
16:20 - 16:40 [E5]	**"Evaluation of time-based ranging methods: Does the choice matter?".....190** Mathias Pelka*, FH Luebeck; Daniel Amann, FH Lübeck; Horst Hellbrück, FH Lübeck / Universität zu Lübeck	
16:40 - 17:00 [E6]	**"A Framework for a Relative Real-Time Tracking System Based on Ultra-Wideband Technology".....196** Gabriel Ortiz*, Chalmers University of Technology; Fredrik Treven, Chalmers University of Technology; Lars Svensson, Chalmers University of Technology; Sebastian Johansson-Mauricio, Cybercom Group AB; Per Larsson-Edefors, Chalmers University of Technology	