2018 15th Workshop on Positioning, Navigation and Communications (WPNC 2018)

Bremen, Germany
25-26 October 2018
**Day 1 - 25th of October 2018**  
IRC Conference Room – Jacobs University Bremen

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| 08:00 – 14:00 | Registration  
Located inside the conference room and operational continuously from 8:00 to 14:00. |
| 08:30 – 08:40 | Welcome and Opening Message  
Giuseppe Abreu, Jacobs University Bremen  
Sven Zeisberg, Dresden University of Applied Sciences  
Jérôme Härri, Eurecom  
Benoît Denis, CEA-Leti |
| **KEYNOTE** | Invited Keynote Talk  
08:40 – 09:30 | Machines Talk Freely: Graph-based Designs for Distributed Wireless Communications  
Prof. Koji Ishibashi, The University of Electro-Communications, Japan |
| 09:30 – 09:40 | Morning Coffee Break (10 mins)  
Coffee, tea and other drinks served along with fruits, cookies and more. |
| **SESSION 1** | Vehicular Localization |
| 09:40 – 09:58 | S1P1: Low-Cost Car Park Localization Using RSSI in Supervised LoRa Mesh Networks  
Petr Gotthard, Konica Minolta;  
Tomáš Jankech, Konica Minolta |
| 09:58 – 10:16 | S1P2: Accuracy Assessment of RTK GNSS based Positioning Systs. for Automated Driving  
Victor Ho, TASS International B.V.;  
Komal Rauf, TASS International B.V.;  
Igor Passchier, TASS International B.V.;  
Frank Rijks, TASS International B.V.;  
Tom Witsenboer, TASS International B.V. |
| 10:16 – 10:34 | S1P3: Cooperative Localization in VANETs: An Experimental Proof-of-Concept Combining GPS, IR-UWB Ranging and V2V Communications  
Gia Minh Hoang, EURECOM and CEA-Leti;  
Benoît Denis, CEA-Leti;  
Jérôme Härri, EURECOM;  
Dirk Slock, EURECOM |
| 10:34 – 10:52 | S1P4: Cooperative Positioning for Urban Environments based on GNSS and IEEE 802.11p  
Paul Schwarzbach, Technische Universität Dresden;  
Benjamin Reichelt, Technische Universität Dresden;  
Oliver Michler, Technische Universität Dresden;  
Patrick Richter, Hochschule für Technik und Wirtschaft Dresden;  
Toralf Trautmann, Hochschule für Technik und Wirtschaft Dresden |
| 10:52 – 11:10 | S1P5: Position Determination Based on a Sensor Data Fusion with Digital Maps and 3D Point Cloud Data  
Sven Eckelmann, Hochschule für Technik und Wirtschaft Dresden;  
Martin Frommel, Hochschule für Technik und Wirtschaft Dresden;  
Christoph Haut, Preh Car Connect;  
Toralf Trautmann, Hochschule für Technik und Wirtschaft Dresden |
SESSION 2  Ranging and Single-Link Radio Parameters Estimation

11:10 – 11:28  S2P1: Coherent Multi-Channel Ranging for Narrowband LPWAN: Simulation and Experimentation Results  31
Florian Wolf, CEA-Leti and Université de Limoges; Jean-Baptiste Doré, CEA-Leti; Xavier Popon, CEA-Leti; Sébastien de Rivaz, CEA-Leti; François Dehmas, CEA-Leti; Jean-Pierre Cances, Université de Limoges

Toyoki Hoshikawa, Hokkaido University; Toshihiko Nishimura, Hokkaido University; Takeo Ohgane, Hokkaido University; Yasutaka Ogawa, Hokkaido University; Junichiro Hagiwara, Hokkaido University

11:46 – 12:04  S2P3: A Novel Ranging Algorithm for RSS-Based Localization  42
Nhat Pham, University of Saskatchewan; Ha Nguyen, University of Saskatchewan; Robert Barton, Cisco Systems Inc.; Jerome Henry, Cisco Systems Inc.

Alexandru Crisan, Politehnica University of Bucharest; Alexandru Martian, Politehnica University of Bucharest; Daniela Coltuc, Politehnica University of Bucharest

12:22 – 12:40  S2P5: Ranging Methods Utilizing Carrier Frequency Offset Estimation  53
Igor Dotlic, Decawave Ltd.; Andrew Connell, Decawave Ltd.; Michael McLaughlin, Decawave Ltd.

12:40 – 13:30  Lunch Break
Lunch at one of the serverities at Jacobs Campus (voucher included with registration)

SESSION 3  Advanced Techniques for Wireless Communications

13:30 – 13:48  S3P1: Full-Duplex Bi-directional MIMO under Imperfect CSI and Hardware Impairments  59
Hiroki Iimori, Ritsumeikan University; Giuseppe Abreu, Jacobs University Bremen; George Alexandropoulos, Huawei Technologies

13:48 – 14:06  S3P2: ZigZag Decodable Coded Slotted ALOHA  65
Masaru Oinaga, The University of Electro-Communications; Shun Ogata, The University of Electro-Communications; Koji Ishibashi, The University of Electro-Communications
**14:06 – 14:24**  
**S3P3: Manifold Optimization-based Hybrid TX/RX Precoding for FD Relay mmWave Systems**  
Shunya Nishikawa, Ritsumeikan University; Giuseppe Abreu, Jacobs University Bremen

**14:24 – 14:42**  
**S3P4: Coded Frameless ALOHA**  
Shun Ogata, The University of Electro-Communications; Koji Ishibashi, The University of Electro-Communications

**14:42 – 15:00**  
**S3P5: Aggregate-Compression-Aided Subcarrier IQ Index Modulation**  
Kazuya Ohira, The University of Electro-Communications; Takanori Hara, The University of Electro-Communications; Koji Ishibashi, The University of Electro-Communications

**15:00 – 15:18**  
**S3P6: 100 Gbps and beyond: Hardware in the Loop experiments with PSSS modulation using 230 GHz RF frontend**  
Karthik Krishnegowda, Brandenburg University of Technology; Pedro Rodríguez-Vázquez, Bergische Universität Wuppertal; Andreas C. Wolf, Dr. Wolf Wireless GmbH; Janusz Grzyb, Bergische Universität Wuppertal; Ullrich R. Pfeiffer, Bergische Universität Wuppertal; Rolf Kraemer, Brandenburg University of Technology

**15:18 – 15:40**  
**Afternoon Coffee Break (22 mins)**

Coffee, tea and other drinks served along with fruits, cookies and more.

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**SESSION 4**  
**Non-radio Localization Techniques and Technologies**

**15:40 – 15:58**  
**S4P1: Optical Camera Communication for Active Marker Identification in Camera-based Positioning Systems**  
Lorenz Gorse, Friedrich-Alexander University Erlangen-Nürnberg; Christoffer Löffler, Fraunhofer Institute for Integrated Circuits IIS; Christopher Mutschler, Fraunhofer Institute for Integrated Circuits IIS; Michael Philipp, Friedrich-Alexander University Erlangen-Nürnberg

**15:58 – 16:16**  
**S4P2: Vision-aided Speed Modulation System to Enhance Seaworthiness of Autonomous Planing Crafts**  
Himabindu Allaka, University of Haifa; Deborah Levy, University of Haifa; Tali Treibitz, University of Haifa; Morel Groper, University of Haifa

**16:16 – 16:34**  
**S4P3: Design and Accuracy Evaluation of a RSS-Based Visible Light Positioning Implementation**  
Willem Raes, KU Leuven; Lieven De Strycker, KU Leuven; Nobby Stevens, KU Leuven
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Talmon Alexandri, University of Haifa;  
Roe Diamant, University of Haifa. |
| 16:52 – 17:10 | S4P5: Robust 3-D Location Estimation in the Presence of Anchor Placement and Range Errors 116  
Mohamed A Suliman, King Abdullah University of Science and Technology;  
Tarig Ballal, King Abdullah University of Science and Technology;  
Mohammed Alsharif, King Abdullah University of Science and Technology;  
Mohamed Saad, King Abdullah University of Science and Technology;  
Tareq Y. Al-Naffouri, King Abdullah University of Science and Technology |

**SPECIAL SESSION 1**  
**Interaction with Industry**  
17:10 – 18:00  

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<td>Autonomous Driving</td>
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<tr>
<td>Preh Car GmbH</td>
<td>V2X Communications</td>
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<tr>
<td>Konica Minolta</td>
<td>LoRa Networked Car Park Localization</td>
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<td>Wiosense GmbH</td>
<td>Wireless Security</td>
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**SPECIAL SESSION 2**  
**Beer Session and Awards Announcements**  
18:00 – 19:30  

Take advantage of the opportunity to discuss further with exhibitors as well as colleagues while enjoying **free beer** and snacks!
## Day 2 - 26th of October 2018
### IRC Conference Room – Jacobs University Bremen

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| 08:30 – 10:50  | **Registration**  
Located inside the conference room and operational continuously from 8:30 to 10:50. |
| 08:50 – 09:00  | **Morning Message and Housekeeping Information**                        |
|              | Giuseppe Abreu, Jacobs University Bremen                                 |
| 09:00 – 09:18  | **SESSION 5**  
**Fingerprinting and Machine Learning** |
|              | **SSP1: DOA Estimation of Two Targets with Deep Learning** 121           |
|              | Yuya Kase, Hokkaido University;  
Toshihiko Nishimura, Hokkaido University;  
Takeo Ohgane, Hokkaido University;  
Yasutaka Ogawa, Hokkaido University;  
Daisuke Kitayama, NTT DOCOMO Research Laboratories;  
Yoshitaka Kishiyama, NTT DOCOMO Research Laboratories |
| 09:18 – 09:36  | **SSP2: Indoor Positioning and Tracking by Multi-Point Observations of BLE Beacon Signal** 126 |
|              | Hiroyuki Torii, Oosaka University;  
Shinsuke Ibi, Oosaka University;  
Seiichi Sampei, Oosaka University |
| 09:36 – 09:54  | **SSP3: A Comparison of Signal Strength Localization Methods with Sigfox** 131 |
|              | Michiel Aernouts, University of Antwerp;  
Ben Bellekens, University of Antwerp;  
Rafael Berkvens, University of Antwerp;  
Maarten Weyn, University of Antwerp |
| 09:54 – 10:12  | **SSP4: Device-free crowd sensing in dense WiFi MIMO networks: channel features and machine learning tools** 137 |
|              | Sanaz Kianoush, CNR-IIEIT Institute;  
Stefano Savazzi, CNR-IIEIT Institute;  
Monica Nicoli, Politecnico di Milano |
| 10:12 – 10:30  | **SSP5: Wireless Tracking for Industrial Services** 143 |
|              | Kanwal Jahan;  
Simon Adler, Fraunhofer Institut für Fabrikbetrieb und -automatisierung IFF Magdeburg;  
Jawad Ahmad, Otto-von-Guericke-University Magdeburg;  
Christian Hansen, Otto-von-Guericke-University Magdeburg |
| 10:30 – 10:50  | **Morning Coffee Break (10 mins)**                                      |
|              | Coffee, tea and other drinks served along with fruits, cookies and more. |
| 10:50 – 11:08  | **SESSION 6**  
**NLOS and Multipath Mitigation** |
|              | **S6P1: A Polarimetric DoA Method for Multipath Phantom Target Suppression in UHF-RFID DoA Estimation Applications** 149 |
|              | Philipp Eschwech, Technical University of Munich;  
Erwin Biebl, Technical University of Munich |
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Simon Ollander, Robert Bosch Car Multimedia GmbH;  
Friedrich-Wilhelm Bode, Robert Bosch Car Multimedia GmbH;  
Marcus Baum, University of Göttingen |
| 11:26 – 11:44 | **S6P3: Differential NLOS Error Detection in UWB-based Localization Systems using Logistic Regression**  161  
Reza Zandian, South Westphalia University of Applied Science;  
Ulf Witkowski, South Westphalia University of Applied Science |
| 11:44 – 12:02 | **S6P4: Predictive NLOS Detection for UWB Indoor Positioning Systems Based on the CIR**  167  
Guido Schroeer, University of Erlangen-Nuremberg;  
Bernhard Haefner, Technical University of Munich |
| 12:02 – 12:20 | **S6P5: Non-Line of Sight Error Mitigation in Bayesian Differential Localization Systems**  172  
Reza Zandian, South Westphalia University of Applied Science;  
Ulf Witkowski, South Westphalia University of Applied Science |
| 12:20 – 12:40 | **Closing Words**                                                      |
|              | Giuseppe Abreu, Jacobs University Bremen  
Sven Zeisberg, Dresden University of Applied Sciences  
Jérôme Härri, Eurecom  
Benoît Denis, CEA-Leti |
| 12:40 – 13:30 | **Lunch Break**                                                        |
|              | Lunch at one of the serveries at Jacobs Campus (voucher included with registration) |