# 2016 13th Workshop on Positioning, Navigation and Communications (WPNC 2016)

Bremen, Germany 19-20 October 2016



**IEEE Catalog Number: ISBN:** 

CFP1693B-POD 978-1-5090-5441-1

#### Copyright © 2016 by the Institute of Electrical and Electronics Engineers, Inc All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

\*\*\*This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.

 IEEE Catalog Number:
 CFP1693B-POD

 ISBN (Print-On-Demand):
 978-1-5090-5441-1

 ISBN (Online):
 978-1-5090-5440-4

ISSN: 2164-9758

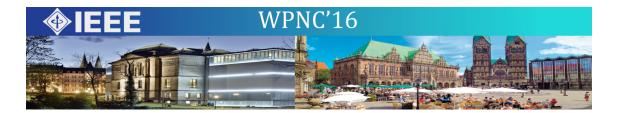
#### Additional Copies of This Publication Are Available From:

Curran Associates, Inc 57 Morehouse Lane Red Hook, NY 12571 USA Phone: (845) 758-0400

Fax: (845) 758-2633

E-mail: curran@proceedings.com Web: www.proceedings.com





### **Table of Contents**

2016 13th Workshop on Positioning, Navigation and Communication (WPNC) at Jacobs University Bremen, Germany (19-20 Oct)

## Technical Session Papers

- [T1] "A Metric to Describe Access Point Significance in Location Estimation,"Marzieh Dashti and Holger Claussen,Nokia Bell Labs, Dublin, Republic of Ireland.
- [T2] "Fundamental Limits in RSSI-based Direction-of-Arrival Estimation," Thorsten Nowak, Markus Hartmann, Lucila Patino-Studencki, Jörn Thielecke, Institute of Information Technology (Communication Electronics) University of Erlangen-Nürnberg, Germany.
- [T3] "Indoor positioning using ambient radio signals: Data acquisition platform for a long-term study,"
   Andrei Popleteev,
   University of Luxembourg, Luxembourg.
- [T4] "An adaptive approach to non-parametric estimation of dynamic probability density functions,"
   Cristian Pana , Stefano Severi and Giuseppe Thadeu Freitas de Abreu , Focus Area Mobility, Jacobs University Bremen, Campus Ring 1, 28759, Bremen, Germany,
   Department of Electrical and Electronic Engineering, Ritsumeikan University, Kusatsu,

Shiga, 525-8577 Japan.

[T5] "Zynq Flexible Platform for Object Recognition & Tracking,"
Murali Padmanabha, Christian Schott, Marko Ro Bler, Daniel Kriesten, Ulrich Heinkel,
University of Technology Chemnitz, Faculty Electrical Engineering and Information
Technology, Chair of Circuit and System Design, Chemnitz, Saxony, Germany.

#### [T6] "GPS-SEC"ce

Levent Altay, Salim Eryigʻit, and Fatih Alagoʻz, Department of Computer Engineering, Bogazici University, Istanbul, Turkey.

[T7] "A Reverse Bearings Only Target Motion Analysis (BO-TMA) for Improving AUV navigation accuracy,"

Talmon Alexandri and Roee Diamant,

Department of Marine Technology, University of Haifa, Israel.

[T8] "Probabilistic Occupancy Grid Map Building for Neobotix MP500 Robot, " Ernő Horváth<sup>†</sup> and Claudiu Radu Pozna<sup>‡</sup>,

†Széchenyi István University Department of Computer Engineering Győr, Hungary.

<sup>‡</sup>Transylvania University of Brasov Faculty of Electrical Engineering Brasov, Romania.

[T9] "An Alternative Double-Sided Two-Way Ranging Method," Dries Neirynck, Eric Luk and Michael McLaughlin,

Decawave Ltd., Dublin, Ireland.

[T10] "Direction of Arrival Estimation for Robots using Radio Signal Strength and Mobility", Christopher J. Lowrance † and Adrian P. Lauf<sup>‡</sup>,

<sup>†</sup>Department of Electrical Engineering and Computer Science, United States Military Academy West Point, NY USA.

<sup>‡</sup>Department of Computer Engineering and Computer Science, University of Louisville Louisville, KY USA.

[T11] "Comparison of wired and wireless synchronization with clock drift compensation suited for U-TDoA localization",

Swen Leugner, Mathias Pelka and Horst Hellbru¨ck, Department of Electrical Engineering and Computer Science, Lu¨beck University of Applied Sciences, Germany

[T12] "Dynamic environment modelling and prediction for autonomous systems", Jan Papadoudis and Anthimos Georgiadis ,Leuphana University Lueneburg, Germany.

## Vehicle Session Papers

[V1] "Cooperative Localization in GNSS-aided VANETs with Accurate IR-UWB Range Measurements",

G.M. Hoang  $^{\dagger \ddagger}$ , B. Denis  $^{\dagger}$ , J. Ha "rri  $^{\ddagger}$ , D. T.M. Slock  $^{\ddagger}$ 

<sup>†</sup>CEA-Leti, MINATEC Campus, 17 avenue des Martyrs, 38054 Grenoble, France

<sup>‡</sup>EURECOM, SophiaTech Campus, 450 route des Chappes, 06904 Biot, France

[V2] "Improved RO-SLAM using Activity Classification for Automated V2X Infrastructure Mapping",

Richard Weber\*, Paul Balzer\*, Oliver Michler\* and Erik Mademann<sup>‡</sup>

\*Technische Universita"t Dresden, Fakulta"t fu"r Verkehrswissenschaften "Friedrich-List" Institut fu"r Verkehrstelematik

<sup>†</sup>ZigPos GmbH, Strehlener Str. 14, 01069 Dresden

[V3] "Multipath Assisted Positioning in Vehicular Applications", Markus Ulmschneider, Ronald Raulefs, Christian Gentner and Michael Walter, Institute of Communications and Navigation of the German Aerospace Centre (DLR), Muncher Str. 20, 82332 Wessling, Germany. [V4] "Testing of positioning and timing for cooperative and autonomous driving systems", Igor Passchier, Gwen van Vugt, Komal Rauf, Tass International BV, Helmond, The Netherlands.

[V5] "Precise Relative Ego-Positioning by Stand-Alone RTK-GPS",
 Thomas Speth\*, Alexander Kamann\*, Thomas Brandmeier\* and Ulrich Jumar\*
 \*CARISSMA, Technische Hochschule Ingolstadt, Ingolstadt, Germany.
 †ifak – Institut fuer Automation und Kommunikation, Magdeburg, Germany.

[V6] "GNSS Vulnerabilities and Vehicle Applications",
Hirofumi Onishi <sup>†</sup>, Kazuo Yoshida <sup>‡</sup>, and Takeshi Kato <sup>‡</sup>
<sup>†</sup>Alpine Electronics Research of America, Inc., 19145 Gramercy Pl., Torrance, CA 90501,

<sup>‡</sup> Alpine Electronics, Inc., 20-1 Yoshima Industrial Park, Iwaki, Fukushima 970-1192, Japan

[V7] "Vehicle Self-Localization for Advanced Driver Assistance Systems",

Ahmad El Assaad<sup>1</sup>, Markus Krug<sup>2</sup>, Georg Fischer<sup>3</sup>

USA

<sup>&</sup>lt;sup>1</sup>Novero GmbH, Nuremberg 90411, Germany

<sup>&</sup>lt;sup>2</sup>Munich University of Applied Sciences, Munich 80335, Germany,

 $<sup>^3{\</sup>rm University}$  of Erlangen-Nuremberg, Erlangen 91058, Germany,

## Poster Session Papers

- [P1] "Adaptive Kalman Filter for Target Tracking in the UWB Networks", Ioan Domuta and Tudor Petru Palade, Faculty of Electronics, Telecommunications and Information Technology Technical University of Cluj-Napoca, Romania.
- [P2] "Comparison of two-way ranging with FMCW and UWB radar systems", Adrian Figueroa, Belal Al-Qudsi, Niko Joram, and Frank Ellinger, Technical University Dresden, Germany.
- [P3] "Introducing a Novel Marker-Based Geometry Model in Monocular Vision", Alexandre Bousaid, Theodoros Theodoridis, Samia Nefti-Meziani, School of CSE, Department of Autonomous Systems and Robotics, University of Salford, UK.
- [P4] "Optimal Wavelet Design for TOA Ranging in the Presence of Synchronization Error",H. Nikookar,the Netherlands Defence Academy, The Netherland.
- [P5] "Reduction of Multipath Propagation Influences at PoA Positioning using Uniform Circular Array Antennas,"

Julia Maria Engelbrecht<sup>1</sup>, Richard Weber<sup>2</sup>, Oliver Michler<sup>2</sup>,

<sup>1</sup>Fraunhofer Institute for Transportation and Infrastructure Systems IVI Dresden, Zeunerstrasse 38, 01069 Dresden, Germany.

<sup>2</sup>University of Technology Dresden, "Friedrich List" Faculty of Transportation and Traffic Sciences, Hettnerstraße 3, 01069 Dresden, Germany.

[P6] "Setting up an Ultra-Wideband Positioning System using Off-the-Shelf Components",
 Marco Gunia, Florian Protze, Niko Joram and Frank Ellinger,
 Chair of Circuit Design and Network Theory (CCN), Technische Universitä Dresden, 01062
 Dresden