# IPIN 2016

## SEVENTH INTERNATIONAL CONFERENCE ON
## INDOOR POSITIONING AND INDOOR NAVIGATION

October
2016 **4·7**

Alcalá de Henares, Madrid · Spain

Universidad
de Alcalá

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# PRESENTATION

Welcome to the Seventh International Conference on Indoor Positioning and Indoor Navigation (IPIN2016) and to Alcalá de Henares, a historic town near Madrid. The town of Alcalá de Henares and, principally, the University of Alcalá have earned recognition as a World Heritage Site. Furthermore, the most important award for writers in the Spanish speaking world, the Cervantes Award, is presented annually by the King of Spain in the Paraninfo (Great Hall) of the University of Alcalá in honor of the famous Spanish writer Miguel de Cervantes who was born in Alcalá de Henares and who was the author of Don Quixote.

Since the first edition, IPIN 2010, held in Zurich (Switzerland) with about 450 participants from academia and industry, this Conference has been an excellent forum to bring together researchers, developers and service providers in positioning and indoor navigation. Subsequent editions, held in Guimarães (Portugal), Sydney (Australia), Montbéliard (France), Busan (Korea) and Banff (Canada), also have shown that there is a large and active community working in this sector.

The IPIN2016 Technical Program Committee (TPC) decided to ask for two types of submissions: Regular Papers (limited to 8 double-column pages, preferably for oral presentation) and Work-in-Progress (limited to 4 double-column pages, preferably for poster presentation). 217 contributions were received (151 Regular Papers and 66 Work-in-Progress). Both types of manuscripts followed a peer review process wherein the TPC selected 110 contributions for oral presentation and 61 for poster presentation. The IPIN2016 Technical Program consists of 22 oral sessions and one poster session, covering a broad range of indoor positioning and navigation topics. The Regular Papers presented at the Conference will be submitted to the IEEE Xplore Digital Library, and the authors of both type of papers will have the opportunity to send technically extended versions of conference papers to IEEE Transactions on Instrumentation and Measurement. Best papers will be awarded during the Conference.

In addition, IPIN2016 has its own competition, divided into 4 tracks, with an average of 6 teams per track, with two special sessions dedicated to presentations for competitors. Furthermore, there will be three Plenary Sessions: two keynote speakers, Professor Moe Win (MIT, USA) and Dr. Thomas Burgess (Indoo.rs, Austria); and one Industry Panel, including representatives from seven leading companies in the conference topics (Sonitor Technologies, FAA Airport Engineering Division, ABB Corporate Research, Samsung Electronics R&D Center, Decawave, Bespoon and HERE Tampere).

Without the help of a number of individuals and public and private institutions, this event would never be possible. We are particularly indebted to the University of Alcalá (Departments of International Relations and Research and Innovation, School of Engineering, Department of Electronics) for the facilities and support provided. We would also like to acknowledge and thank the support of our Technical Sponsors (IEEE Geoscience and Remote Sensing Society, IEEE Instrumentation and Measurement Society and IEEE Sección España) and our Competition Sponsors (ETRI, KICS, ASTI and Tecnalia).

The members of the TPC have done a remarkable job in reviewing the papers submitted to the Conference in such a short space of time. Furthermore, IPIN2016 has been made possible thanks to the hard work of the members of the Organizing Committees and the Competition Chairs, to whom we are very grateful.

Finally, we wish to thank you for coming to IPIN2016 - the success of this event will depend on the contribution you make. We hope you will enjoy our Conference and the beautiful town of Alcalá de Henares.

October 2016

Prof. Jesus Ureña and Prof. Kyle O'Keefe
Conference Co-Chairs

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- **Francesco Potortì** (CNR-ISTI, Italy), potorti@isti.cnr.it
- **Antonio R. Jiménez** (CSIC, Spain), antonio.jimenez@csic.es
- **Sangjoon Park** (ETRI, South Korea), sangjoon@etri.re.kr

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# DETAILED PROGRAM

## TUESDAY, 4 OCTOBER

**09:00** h  Registration **North (Blue) Building Hall**

**09:30** h  On-site competitions (Track 1 and Track 2). **North (Blue) Building Hall**

Competitors should gather at the meeting point for their specific track. The competition will last the whole day.

**14:00-19:30** h  Tutorials. **Laboratories, first floor, West (Red) Building**

   14:00-16:30 h  **Tutorial 1**: "Acoustic Positioning Systems", Dr Fernando Álvarez

   16:30-17:00 h  Coffee Break

   17:00-19:30 h  **Tutorial 2**: "Fingerprinting-based Indoor Positioning", Dr Raúl Montoliu

**14:00** h  Track 4 Competition. **North (Blue) Building Hall**

Registration and order of participation draw

   **14:30-15:15** h  Team A

   **15:15-16:00** h  Team B

   **16:00-16:45** h  Team C

   **16:45-17:30** h  Team D

   **17:30-18:15** h  Team E

## WEDNESDAY, 5 OCTOBER

**08:15** h  Registration **North (Blue) Building Hall**

**09:00** h  **Opening Ceremony. Auditorium**

**Keynote. Dr Thomas Burgess**, Indoo.rs, Austria. **Auditorium**

"Indoor Navigation: The Crowd is the future - Crowd learning for indoor positioning"

**10:00** h  Coffee Break

**10:30h-12:30** h  **Parallel Sessions 1**

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67  Performance Comparison of Foot- and Pocket-Mounted Inertial Navigation Systems
*Dina Bousdar, Estefania Munoz Diaz and Susanna Kaiser*

84  Detecting Elevators and Escalators in 3D Pedestrian Indoor Navigation
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207  Calibration of Beacons for Indoor Environments based on a Map-Matching Technique
*David Gualda, Jesús Ureña Ureña, Juan Carlos García, José Manuel Alcalá and Alberto Noboru Miyadaira*

212  Solid image generation for indoor image based positioning. The Bangbae metro station in Seoul
*Filiberto Chiabrando, Vincenzo Di Pietra, Andrea Lingua, Juil Jeon and Youngsu Cho*

215  WiFi FTM and Map Information Fusion for Accurate Positioning
*Leor Banin, Yuval Amizur and Uri Schatzberg*

217  Combining SURF and SIFT for Challenging Indoor Localization using a Feature Cloud
*Marvin Ferber, Mark Sastuba and Bernhard Jung*

## P17. Magnetic Localization

134  An Improved RSSI of Geomagnetic Field- Based Indoor Positioning Method Involving Efficient Database Generation by Building Materials
*Jinseon Song, Soojung Hur, Yongwan Park and Jeonghee Choi*

222  Position estimation by means of an magnetometer and Inclinometer - An algorithm evaluation
*Abdelmoumen Norrdine, Zakari Kasmi and Jörg Blankenbach*

230  Locating a Magnet in the Near-field
*Chao Hu, Zhihuan Zhang, Xiaohe You and Yupeng Ren*

### P18. Innovative Systems

189  2.4 GHz Synthetic Linear Antenna Array for Indoor Propagation Measurements in Static Environments
*Stijn Wielandt, Jean-Pierre Goemaere and Lieven De Strycker*

242  First evaluation of a system of positioning of Microrobot with ultra-dense distribution
*Dermas Moffo, Philippe Canalda and François Spies*

### P19. Applications of Location Awareness & Context Detection

176  Location Aware Tracking with Beacons
*Gary Mansell and Kevin Curran*

228  Location-Based Group Clustering Using BLE Beacons in an Unconstrained Indoor Space
*Akihiro Sato and Naohiko Kohtake*

233  A Hybrid Method for Indoor Positioning Based on Wirless Network and Smartphone Camera
*Jichao Jiao, Fei Li, Zhongliang Deng and Wen Liu*

238  GUIMUS: a smartguide based on an Acoustic FSK protocol
*Fernando J. Álvarez Franco, Teodoro Aguilera, Jorge Morera and José A. Moreno*

**18:30** h  University Welcome & Reception Cocktail.
**(Old University building, Plaza de San Diego, city center)**

## THURSDAY, 6 OCTOBER

**08:15** h  Registration. North (Blue) Building Hall

**09:00** h  Keynote. Professor Moe Win. MIT, USA. Auditorium
"Location, location, and location!"

**10:00** h  Coffee Break

**10:30-12:30** h  Parallel Sessions 3

### A3. TOF, TDOA based Localization. Room NA6
**Chairperson**: Norbert Franke

46  Indoor Positioning Using LTE Signals
*Marco Driusso, Chris Marshall, Mischa Sabathy, Fabian Knutti, Heinz Mathis and Fulvio Babich*

76  Firefly Based Distributed Synchronization in Wireless Sensor Networks for Passive Acoustic Localization
*Erik Verreycken, Dennis Laurijssen, Walter Daems and Jan Steckel*

104  Ranging Error Estimation in Indoor Environment at 10 GHz
*Camelia Skiribou, Raja Elassali, Fouzia Elbahhar Boukour, Aziz Benlarbi-Delaï, Khalid Elbaamrani and Noureddine Idboufker*

138  Optimal Microphone Placement for Indoor Acoustic Localization using Evolutionary Optimization
*Roberto Macho-Pedroso, Francisco Domingo-Pérez, José Velasco-Cerpa, Cristina Losada-Gutiérrez and Javier Macias-Guarasa*

160  Android application for indoor positioning of mobile devices using ultrasonic signals
*María del Carmen Pérez, David Gualda Gómez, José Manuel Villadangos Carrizo, Jesús Ureña Ureña, Pablo Pajuelo, Edel Díaz LLerena and Enrique García Núñez*

## B3. Localization, Algorithms for Wireless Sensor Networks. Auditorium
### Chairperson: Adriano Moreira

41 Smartphone Positioning in Multi-Floor Environments Without Calibration or Added Infrastructure
*Simon Burgess, Kalle Åström, Björn Lindquist and Rasmus Ljungberg*

48 Towards Feasible Wi-Fi based Indoor Tracking Systems Using Probabilistic Methods
*Lorenz Schauer, Philipp Marcus and Claudia Linnhoff-Popien*

107 An Enhanced WiFi Indoor Localization System Based on Machine Learning
*Ahmed Salamah, Mohamed Tamazin, Maha Sharkas and Mohamed Khedr*

123 Wi-Fi probes as digital crumbs for crowd localisation
*Francesco Potorti, Antonino Crivello, Michele Girolami, Emilia Traficante and Paolo Barsocchi*

159 Multilateration Localization Based on Singular Value Decomposition for 3D Indoor Positioning
*Jihoon Yang, Haeyoung Lee and Klaus Moessner*

## C3. Frameworks for Hybrid Positioning. Room NA5
### Chairperson: Kyle O'Keefe

36 Experimental Evaluation of Visual Place Recognition Algorithms for Personal Indoor Localization
*Michal Nowicki, Jan Wietrzykowski and Piotr Skrzypczyński*

40 A Pipeline Architecture for Indoor Location Tracking
*Marcus Dombois and Sebastian Döweling*

45 IMU/Magnetometer based 3D Indoor Positioning for wheeled Platforms in NLoS scenarios
*Hendrik Hellmers, Abdelmoumen Norrdine, Jörg Blankenbach and Andreas Eichhorn*

112 Comparison of Post-processing Algorithms for Indoor Navigation Trajectories
*Kersane Zoubert-Ousseni, Christophe Villien and François Le Gland*

131 RSS-INS Integration for Cooperative Indoor Positioning
*Vahid Dehghanian and Matthew Lowe*

### D3. Mapping, SLAM. Room NA7
**Chairperson**: Daniel Albuquerque

31 Step and activity detection based on the orientation and scale attributes of the SURF algorithm
*Chadly Marouane, Andre Ebert, Claudia Linnhoff-Popien and Maximilian Christil*

65 Dense mapping for Monocular-SLAM
*Abiel Aguilar-González and Miguel Arias-Estrada*

116 A Binary Robust Line Descriptor
*Shiwei Zhuang, Danping Zou, Ling Pe,i Di He and Peilin Liu*

122 Analyzing LiDAR Scan Skewing and its Impact on Scan Matching
*Anas Al-Nuaimi, Wilder Lopes, Paul Zeller, Adrian Garcea, Cassio G. Lopes and Eckehard Steinbach*

174 Reduction of Ultrasonic Indoor Localization Infrastructure based on the use of Graph Information
*David Gualda, Jesús Ureña Ureña, Juan Carlos García, José Manuel Alcalá and Alberto N. Miyadira*

### E3. Other systems and applications. Room NA8
**Chairperson**: Masanori Sugimoto

38 A Spot-controllable Data Transfer Technique Using COTS Speakers
*Masanari Nakamura, Takayuki Akiyama, Hiromichi Hashizume and Masanori Sugimoto*

56 Exploiting Ground Reflection for Robust 3D Smartphone Localization
*Joan Bordoy, Johannes Wendeberg, Fabian Höfflinger, Christian Schindelhauer and Leonhard Reindl*

100 Binarized-BLSTM-RNN based Human Activity Recognition
*Marcus Edel, Enrico Köppe and Simon Schmitt*

102 Fitting for Smoothing: A Methodology for Continuous-Time Target Track Estimation
*Tiancheng Li, Javier Prieto and Juan Corchado*

158   Beacon Placement for Range-Based Indoor Localization
*Niranjini Rajagopal, Sindhura Chayapathy, Bruno Sinopoli and Anthony Rowe*

**12:00** h   Lunch

**14:00h-16:00** h   **Parallel Sessions 4**

### A4. Novel uses of maps and 3D building models. Room NA5

**Chairperson**: Fernando Álvarez

24   A Low Complexity Map-Aided Fuzzy Decision Tree for Pedestrian Indoor/Outdoor Navigation Using Smartphone
*Jhen Kai Liao, Kai Wei Chiang, Guang Je Tsai and Hsiu Wen Chang*

66   Pedestrian Indoor Navigation for Complex Public Facilities
*Olaf Czogalla and Sebastian Naumann*

70   Anchor Node Placement in Complex Environments with Physical Raytracing and Genetic Algorithms
*Tilman Leune, Carsten Koch and Gerd von Cölln*

115   InLoc: An End-to-End Robust Indoor Localization and Routing Solution using Mobile Phones and BLE Beacons
*Vivek Chandel, Nasimuddin Ahmed, Shalini Arora and Avik Ghose*

129   Conditional Erosion to Estimate Routing Graph out of Floor Plans
*Simon Schmitt, Larissa Zech, Thomas Willemsen, Harald Sternberg and Marcel Kyas*

### B4. Magnetic Localization. Room NA6

**Chairperson**: Raúl Montoliu

75   A Motion Tracking Solution for Indoor Location Using Smartphones
*Vânia Guimarães, Lourenco Castro, Susana Carneiro, Manuel Monteiro, Tiago Rocha, Marília Barandas, João Machado, Maria Vasconcelos, Hugo Gamboa and Dirk Elias*

110 A Heading Error Estimation Approach based on Improved Quasi-static Magnetic Field Detection
*Ming Ma, Qian Song, Yang-huan Li, Yang Gu and Zhi-min Zhou*

119 Magnetic Field based Indoor Positioning Using the Bag of Words Paradigm
*Raúl Montoliu, Joaquín Torres-Sospedra and Oscar Belmonte*

153 Camera-aided Region-based Magnetic Field Indoor Positioning
*Yinchen Du, Tughrul Arslan and Arief Juri*

## C4. Innovative Systems Room NA8
### Chairperson: Felipe Espinosa

60 Floor vibration type estimation with piezo sensor toward indoor positioning system
*Yukitoshi Kashimoto, Manato Fujimoto, Hirohiko Suwa, Yutaka Arakawa and Keiichi Yasumoto*

81 Mapless Indoor Localization by Trajectory Learning from a Crowd
*Jaehyun Yoo, H. Jin Kim and Karl Johansson*

142 Smart laser scanner for event-based state estimation applied to indoor positioning
*Miguel Martínez-Rey, Enrique Santiso, Felipe Espinosa, Rubén Nieto and Alfredo Gardel*

148 Multipath-Assisted Angle of Arrival Indoor Positioning System in the 2.4 GHz and 5 GHz Band
*Stijn Wielandt, Jean-Pierre Goemaere and Lieven De Strycker*

163 Fusion of Security Camera and RSS Fingerprinting for Indoor Multi-Person Tracking
*Christopher Nielsen, John Nielsen and Vahid Dehghanian*

## D4. Applications of Location Awareness & Context Detection. Room NA7
### Chairperson: Elizabeth Colin

29 Online Self-Calibration of the Propagation Model for Indoor Positioning Ranging Methods
*Grigorios G. Anagnostopoulos, Michel Deriaz and Dimitri Konstantas*

32   Visual Odometry using motion vectors from visual feature points
*Chadly Marouane, Marco Maier, Alexander Leupold and Claudia Linnhoff-Popien*

79   Indoor Positioning of Shoppers Using a Network of Bluetooth Low Energy Beacons
*Patrick Dickinson, Greg Cielniak, Olivier Szymanezyk and Mike Mannion*

132   Location Awareness Enables Autonomous Commissioning in Wireless Sensor Networks
*Stijn Crul, Geoffrey Ottoy and Lieven De Strycker*

164   Optimal Placement of Landmarks for Indoor Localization using Sensors with a Limited Range
*Payam Nazemzadeh, Daniele Fontanelli and David Macii*

### E4. Competition Presentations (I). Auditorium

### Track 1. Smartphone-based.

**Chairpersons**: Paolo Barsocchi and Michele Girolami

| Team # | Work description and team members |
| --- | --- |
| 1 | Multi Sensor Indoor Localisation<br>*Toni Fetzer, Frank Ebner, Frank Deinzer and Marcin Grzegorzek* |
| 2 | Integrating Wi-Fi and Magnetic Field for Fingerprinting Based Indoor Positioning System<br>*Yuntian Brian Bai, Tao Gu and Andong Hu* |
| 3 | Navix: Smartphone Based Hybrid Indoor Positioning<br>*J. C. Aguilar Herrera and A. Ramos* |
| 4 | WiMag: Multimode Fusion Localization System based on Magnetic/WiFi/PDR<br>*Haiyong Luo, Qu Wang, Wenhua Shao, Dongmeng Li, Xumeng Guo and Fang Zha* |
| 5 | A Real-time Indoor Tracking System by Fusing Inertial Sensor, Radio Signal and Floor Plan<br>*José Luis Carrera, Zhongliang Zhao, Torsten Braun and Zan Li* |

6 Hand-held Indoor Positioning System Based On Smartphone
*Lingxiang Zheng, Yizhen Wang, Ao Peng, Zongheng Wu, Shaolin Wen, Biyu Tang, Hai Lu, Haibin Shi and Huiru Zheng*

7 Multi-modal indoor localization based on wireless LAN, mobile sensors
*Andrew YongGwon Lee, Abhishek Kumar, Pawel Wilk, Wojciech Jaworski*

### Track 3. Smartphone-based (off-site)

**Chairpersons**: Joaquín Torres and Fernando Seco

| Team # | Work description and team members |
|---|---|
| 1 | WiFi Fingerprinting using Bayesian and Hierarchical Supervised Machine Learning assisted by GPS<br>*Yair Beer* |
| 2 | Smartphone-based User Location Tracking in Indoor Environment<br>*Viet-Cuong Ta, Dominique Vaufreydaz, Dao Trung Kien and Eric Castelli* |
| 3 | Indoor tracking from multidimensional sensor data<br>*Adriano Moreira, Maria João Nicolau, António Costa and Filipe Meneses* |
| 4 | Multi Sensor Indoor Localisation<br>*Toni Fetzer, Frank Ebner, Frank Deinzer and Marcin Grzegorzek* |
| 5 | Smartphone positioning in large environments by sensor data fusion, particle filter and FCWC<br>*Stefan Knauth and Athanasios Koukofikis* |

**16:00** h   Coffee break
**16:30h-18:30** h   **Parallel Sessions 5**

#### B5. High Sensitivity GNSS, Indoor GNSS, Pseudolites. Room NA5

**Chairperson**: Andreas Wieser

44 Sensitivity of Projection-Based Near-Far Mitigation Techniques in High-Sensitivity GNSS Software Receivers
*Sergi Locubiche-Serra, José A. López-Salcedo and Gonzalo Seco-Granados*

52 A GNSS-based Inverted Radar for Carrier Phase Absolute Indoor Positioning Purposes First experimental results with GPS signals
*Nel Samama, Alexandre Vervisch-Picois and Thierry Taillandier-Loize*

61 A Combined Approach of Doppler and Carrier-based Hyperbolic Positioning with a Multi-channel GPS-pseudolite for Indoor Localization of Robots
*Kenjiro Fujii, Ryosuke Yonezawa, Yoshihiro Sakamoto, Alexander Schmitz and Shigeki Sugano*

63 Delta Carrier Range Algorithm for Indoor Positioning Application to Pseudolite-like Transmitters
*Alexandre Vervisch and Nel Samama*

170 Innovative Techniques for Collective Detection of Multiple GNSS Signals in Challenging Environments
*Maherizo Andrianarison, Mohamed Sahmoudi and René Jr Landry*

## C5. Passive & Active RFID. Room NA6
### Chairperson: Günther Retscher

47 Positioning using ambient magnetic fields in combination with Wi-Fi and RFID
*Andreas Ettlinger and Günther Retscher*

90 Low-Complexity PDoA-based Localization
*Benjamin Sackenreuter, Niels Hadaschik, Marc Faßbinder and Christopher Mutschler*

113 A Survey of Problems and Approaches in Wireless-based Indoor Positioning
*Felis Dwiyasa and Meng-Hiot Lim*

125 RFID-based centralized cooperative localization in indoor environments
*Fernando Seco, Antonio R. Jiménez Ruiz and Xufei Zheng*

144 Full-scale Testing and Performance Evaluation of an Active RFID System for Positioning and Personal Mobility
*Vassilis Gikas, Guenther Retscher, Andreas Ettlinger, Harris Perakis and Andreas Dimitratos*

## D5. Indoor Spatial Data Model & Indoor Mobile Mapping. Room NA7
### Chairperson: Valérie Renaudin

54 Easing the Survey Burden: Quantitative Assessment of Low-Cost Signal Surveys for Indoor Positioning
*Chao Gao and Robert Harle*

72 Door Detection in 3D Colored Laser Scans for Autonomous Indoor Navigation
*Blanca Quintana, Samuel A. Prieto, Antonio Adán and Frédéric Bosché*

73 A multisource and multivariate dataset for indoor localization methods based on WLAN and geomagnetic field fingerprinting
*Paolo Barsocchi, Antonino Crivello, Davide La Rosa and Filippo Palumbo*

127 Accurate Indoor Georeferencing with Kinematic Multi Sensor Systems
*Sören Vogel, Hamza Alkhatib and Ingo Neumann*

143 A multi-hypothesis particle filtering approach for pedestrian dead reckoning
*Fadoua Taia Alaoui, David Betaille and Valerie Renaudin*

## E5. Competition Presentations (II). Auditorium

## Track 2. Pedestrian dead reckoning positioning
### Chairpersons: Soyeon Lee and Jae Hyun Lim

#### Team #   Work description and team members

1 Motion estimation of a Rigid Body with an EKF using Magneto-Inertial Measurements
*Charles-Ivan Chesneau, Mathieu Hillion and Christophe Prieur*

2 Foot Mounted Inertial Navigation System using Estimated Velocity During the Contact Phase
*Hojin Ju, So Young Park and Chan Gook Park.*

3 Foot-mounted indoor Pedestrian Positioning System based on Low-cost Inertial Sensors
*Ao Peng, Lingxiang Zheng, Wencheng Zhou, Chaohui Yan, Yizhen Wang, XiaoYang Ruan, Biyu Tang, Haibin Shi, Hai Lu and Huiru Zheng*

4 Pedestrian Positioning from Wrist-worn Wearable Devices
*Luis Enrique Díez and Alfonso Bahillo*

5 A Multifloor Hybrid Inertial/Barometric Navigation System
*Nicolò Strozzi, Federico Parisi and Gianluigi Ferrari*

6 Accurate Dual-foot Micro-inertial Navigation System with Inter-agent Ranging
*ZhouLing Xiao, YiZhuo Yang, Rui Mu and JianBo Liang*

7 D-ZUPT based Pedestrian Dead-Reckoning System Using Low Cost IMU
*Yu Liu, Kai Guo and Shenglong Li*

8 3D Pedestrian Dead Reckoning Based on Kinematic Models in Human Activity by Using Multiple Low-Cost IMUs
*Jihoon Yang, Haeyoung Lee and Klaus Moessner*

## Track 4. Indoor mobile robot positioning

### Chairpersons: María C. Pérez and Cristina Losada

#### Team #    Work description and team members

1 ATLAS – An Open-Source TDOA-based Ultra-Wideband Localization System
*Janis Tiemann, Fabian Eckermann and Christian Wietfeld*

2 Aidloc: A high acoustic smartphone indoor localization system with NLOS identification and mitigation
*Zhi Wang, Lei Zhang, Feng Lin and Danjie Huang*

3 Indoor Localization using Visible Light
*Siu Wai Ho*

| 4 | TOPOrtls TPM UWB wireless system technical description |
| | *Maksim Katkov and Sergey Huba* |
| 5 | Technical description of Locate-US: an Ultrasonic Local Positioning System based on Encoded Beacons. **(Out of Competition)** |
| | *J. Ureña, J. M. Villadangos, D. Gualda, M. C. Pérez, A. Hernández, J. J. García, A. Jiménez, J. C. García, J. F. Arango and E. Díaz* |

**19:30h-20:30** h  Alcalá de Henares visit. **(From Plaza Cervantes, city center)**

**20:30** h  Gala Dinner. **(Restaurant Hostería del Estudiante, city center)**

Attendees can enjoy a live "Flamenco Show" after Gala Dinner in "Aula de Música"

(c/ Colegios 10, city center) (estimated duration 45 minutes)

## FRIDAY, 7 OCTOBER

**9:00** h   **Industry Panel. Auditorium**

**Moderator**: Fernando Álvarez, University of Extremadura, Spain

| Speaker | Company |
| --- | --- |
| Dr Wilfred E. Booij | Sonitor Technologies, Norway |
| Nayeem Hoq | FAA Airport Engineering Division, USA |
| Linus Thrybom | ABB Corporate Research, Sweden |
| Pawel Wilk | Samsung Electronics R&D Center, Poland |
| Mickael Viot | Decawave Vice President of Marketing, Ireland |
| Pascal Fabré | Bespoon, France |
| Dr Lauri Wirola | HERE Tampere, Finland |

**10:15** h   Coffee Break

**10:45** h   **Best papers presentation. Auditorium**

**12:00** h   **Competition Awards Ceremony. Auditorium**

**13:00** h   **Closing Ceremony & IPIN2017 Presentation. Auditorium**

**13:30** h   Farewell Cocktail. **North (Blue) Building Hall**

# GENERAL INFORMATION

## A. CONFERENCE VENUE

The Conference will be held in the Escuela Politécnica (School of Engineering) of the University of Alcalá, Campus Universitario de la Universidad de Alcalá, carretera Madrid-Barcelona, km. 33,600. It is located within 20 minutes by bus distance from the city centre and from most hotels. Most of Conference activities are organized in the North Building (blue area).



## B. REGISTRATION

The Registration Desk is located in the hall of the North Area at the Escuela Politécnica (School of Engineering).
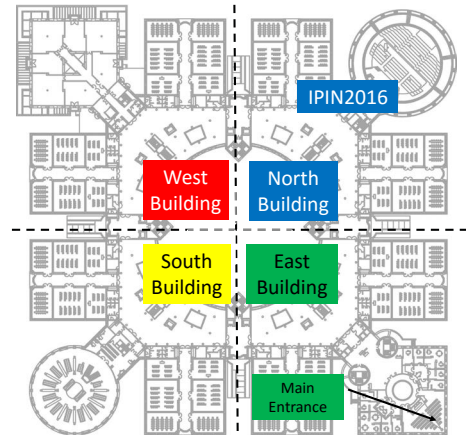
Opening hours:
Tuesday, 4th October: 09:00 - 12:00h
Wednesday, 5th October: 08:15 - 12:30 and 13:30 - 17:30 h.
Thursday, 6th October: 08:15 - 12:30 and 13:30 - 18:30 h.
Friday, 7th October: 08:30 - 13:30

## C. PRESENTATIONS

### 1. ORAL PRESENTATIONS

Each oral presentation will last 22 minutes, including 4-5 minutes for questions. We recommend you prepare your slides (including all media data needed) for a duration of 17-18 minutes. Each presentation room will be equipped with a video projector with a VGA connector and a Windows laptop with PowerPoint and Adobe Acrobat Reader. Please remind to embed all fonts in your presentation files. All authors should load their presentations during the break preceding their presentation sessions.

The Conference Program is organized in parallel sessions, and they will be held in different rooms (North building – blue area):

- **Plenary Sessions Room - Auditorium**: Keynotes; Sessions A1, A2, B3, E4 and E5; Industry Panel; Best Papers Presentation; Competition Awards Ceremony and Closing Ceremony.
- **Room NA5**: Sessions B1, B2, C3, A4 and B5
- **Room NA6**: Sessions C1, C2, A3, B4 and C5
- **Room NA7**: Sessions E1, E2, D3, D4 and D5
- **Room NA8**: Sessions D1, D2, E3 and C4

### 2. POSTER SESSION

Posters can be displayed on Wednesday morning. Presenting authors should be close to their posters during the whole Poster Session (Wednesday afternoon, 16:00h-17:30h). If the authors wish, poster can keep displayed until Friday, 7th October.

Poster board dimensions are enough for a DINA0 portrait poster (84.1cmx118.9cm).

## D. LUNCHES, COFFEE BREAKS AND BANQUET

Lunches and coffee services will be provided free of charge from Wednesday to Friday for the registered attendees.

**Coffee breaks** will be held in the courtyard of the Escuela Politécnica (School of Engineering) and **Lunches** in the cafeteria. Both of them will be served according to the Conference Program timetable.

Finally, the **Gala Dinner** will be held in Hostería del Estudiante (c/ Colegios, 3), at 20:30 on Thursday, 6th October. A limited number of extra tickets for non-registered attendees will be available for being purchased at the Registration Desk.

## E. INTERNET ACCESS

Internet access will be available at Room OA.5 (Computer Room) in the Escuela Politécnica (School of Engineering). The Conference Organization will provide three laptops for the registered participants.

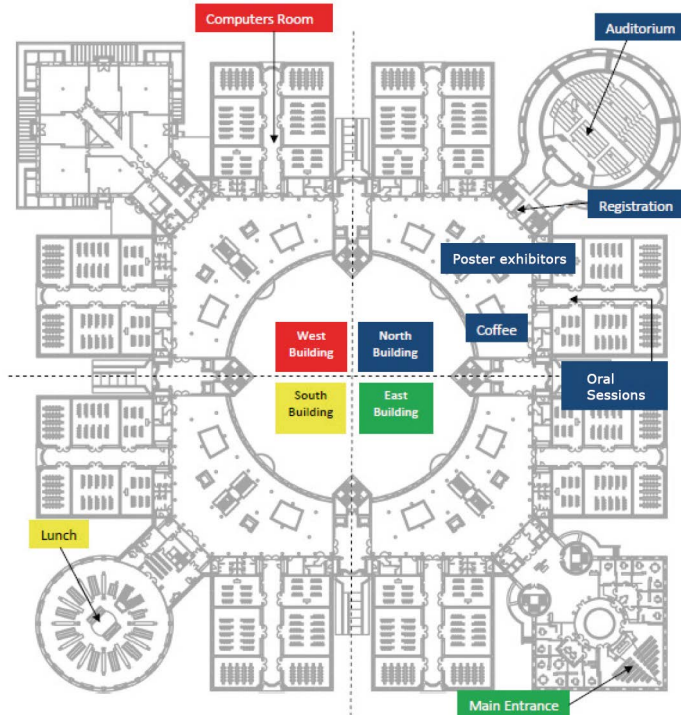Free WIFI will be also available at the building:

- SSID Name: congresos
- Password: UAHcongresos2016

## F. GUIDED VISITS

- Ancient building of the University of Alcalá (Rectorado). The visit will be held on Wednesday, 5th October at 18:30h. Meeting point: city center, Plaza de San Diego (San Diego square).
- Alcalá de Henares Old City Center. The visit will be held on Thursday, 6th October at 19:30h. **Meeting point**: city center, Plaza de Cervantes (Cervantes square), statue of "Miguel de Cervantes" (center of the square).

Alcalá de Henares, City Center

Escuela Politécnica
School of Engineering
(Ground Floor)

Universidad de Alcalá

# IPIN 2016

**OCTOBER 2016**

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