Call for competition
5-6 September 2020 – Beijing, China
IPIN is pleased to announce the seventh IPIN 2020 Indoor Localization Competition, in conjunction with the IPIN 2020 Conference in Beijing (China). The competition is aimed at bringing together the academic and industrial research communities for evaluating different approaches and envisioning new research opportunities for the indoor localization area, where no generally accepted standards exist yet.

IPIN 2020 Indoor Localization Competition will consist of several tracks, including on-site and off-site contests. Results will be presented at the final plenary session. The competition builds on the experience of previous competitions and is based on the EvAAL framework, ensuring experience, solidity and a well-founded scientific method. In 2020 the competition hosts six different tracks:

- **Track 1** - Smartphone-based
- **Track 2** - Video-based
- **Track 3** - Smartphone-based (off-site)
- **Track 4** - Foot-mounted IMU based (off-site)
- **Track 5** - xDR in industrial scenarios (off-site)
- **Track 6** - On-vehicle smartphone based (off-site)

The winner of each track will be awarded a prize of 10000 ¥. Track winners will be requested to give an oral presentation.

On-site tracks

The competition will take place in the selected indoor malls in Beijing. An actor carries the competing system by walking in and between multi-floor buildings. Position estimates are provided in real time. Data processing is local, without using any external aid. Survey of the area and system calibration is restricted to a single day.

**Track 1** - Smartphone based: The actor carries a smartphone which runs the competing system, using the sensors available on the smartphones to identify the user's position.

**Track 2** - Video based: An actor walks under realistic conditions in multi-floor buildings using vision-based positioning technology. Here, 'vision-based' competing system can use any other aiding sensors (i.e. IMU, Barometer, etc.) except 'Lidar'. The competing system can be located in any part of actor's body except foot.

Off-site tracks

Competitors calibrate their algorithms in advance using a ground truth reference database, and compete using new unreferenced data.

**Track 3** - Smartphone based: A pedestrian walks under realistic conditions in multi-floor buildings using data provided by a conventional smartphone.

**Track 4** - Foot-mounted IMU based: A pedestrian carries PERSY (PEdestrian Reference SYstem) a state-of-the-art Inertial Navigation System producing IMU data, MAG data & GNSS data. Maps are not provided.

**Track 5** - xDR in industrial scenarios: Practical performance of xDR methods in industrial scenarios is evaluated. Sensor data are measured in actual operations in an actual industrial site by Android devices.

**Track 6** - On-vehicle smartphone based: A conventional smartphone is fixed at the inside front of the test vehicle, using all the necessary data collected by the smartphone in indoor and outdoor scenarios.

Technical competition details

The evaluation criteria for the competition, restrictions on the accepted technologies, technical rules to follow and a description of the benchmarks are detailed in the technical annexes to this call.
Announcements and possible refinements of the annexes, also based on candidate competitors' comments, will be timely distributed on the competition discussion mailing list contest@evaal.aaloa.org and will appear on the IPIN website.

All the data gathered by the competition committee during the competition, including data produced by competing systems, will be published after the competition for the purpose of research and comparison. Winners of the competition will be announced during the conference.

**Competitor admission process**

A competitor can be any individual or group of individuals working as a single team, associated to a single or a number of organizations, who wants to participate in one or several tracks. Only one team from the same organization (laboratory) is allowed to compete.

Competitors apply for admission to the competition tracks by providing a short (2 to 4 pages) technical description of their localization system (in PDF), which includes a description of the algorithms and protocols used. The technical description must be sent by e-mail to the chairs of the intended track, which is indicated in the relative annex. Track chairs will accept or refuse the application in a short time, based on technical feasibility and logistic constraints.

After acceptance of the competitor's technical description, one member of the competing team is required to register to the IPIN conference, specifying that the registration is linked to a competition track. Full registration to the conference covers participation in the competition process (allotted time, support and space) for a single track and submission of one paper describing the system or, alternatively, participation in the competition for two tracks and no paper submission.

Competitors who are authors of an accepted paper describing their system will be allowed some days after the conference for updating it before publication in order to add new data gathered during the competition.

Competitors who wish to test their system, but do not want to be included in the public rankings and compared with other competitors, may ask for that special condition in advance to the chairs of the relevant track, who can accept or refuse the application depending on their organizational constraints.

Competitors who wish to test their on-site system which does not fit any of the on-site tracks may ask chairs of Track 1 to be admitted off-track, which will be granted depending on organizational constraints.

**Committees**

**Competition chairs**

Francesco Potortì, ISTI-CNR (IT)

Sangjoon Park, ETRI (KR)

**Track 1 - Antonino Crivello, Filippo Palumbo, ISTI-CNR (IT)**

**Track 2 - Soyeon Lee, ETRI (KR)**

**Track 3 - Joaquín Torres-Sospedra, Antonio R. Jiménez Ruiz** University Jaume I (ES), CSIC (ES)

**Track 4 - Miguel Ortiz, Johan Perul, GEOLOC Team, Ifsttar (FR)**

**Track 5 - Ryosuke Ichikari, Ryo Shimomura, AIST and University of Tsukuba (JP)**

**Track 6 - Xinchun Ji, Dongyan Wei, AIR, CAS (CN)**

**Secretary of Competition**

Wenchao Zhang, AIR, CAS (CN)

<table>
<thead>
<tr>
<th>Competition - Tentative Dates</th>
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<tbody>
<tr>
<td>Technical description:</td>
<td>1 July, 2020</td>
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<tr>
<td>Notification of admission:</td>
<td>1 week time</td>
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<tr>
<td>Result submission (off-site tracks):</td>
<td>August 22, 2020</td>
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<tr>
<td>Survey and setup (on-site tracks)</td>
<td>September 5, 2020</td>
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<td>Competition (on-site tracks):</td>
<td>September 6, 2020</td>
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Last update December 19, 2019