Track3 "Smartphone based Positioning (off-site)"special features

Organizational aspects:

Database/dataset download

- Participants can download the training and validations samples from this site:
  http://indoorloc.uji.es/ipin2020track3/
  Datasets will be available on October 4th
  Competitors can only use the data provided for the competition in the website.
  Performing any additional on-site calibration is not allowed.

Submission of results

- Despite being an off-site track, we will ask to competitors to process data as if they were streamed in real time. To do so, a new interface based on a API has been developed: EvaalAPI. This API will be used by competitors for sending position estimates and reading the sensor readouts: https://evaal.aaloa.org/evaalapi/
- A participant team can upload up to 3 different contributions, which will be evaluated by the competition organizers. Although the three alternatives will be evaluated on the final test set, only the best one will be considered for the contest.

Submission deadline of the post-processed indoor coordinates

- Data will be published in website (training, validation) and EvaalAPI (evaluation): **OCTOBER 4 th 2021**
- The deadline for submitting the post-processed results is: **NOVEMBER 18th 2021**
- Proclamation of winners: **DECEMBER 2nd 2021**

Scope

A spectacular growth of indoor localization solutions has been witnessed during the last decade. Many different positioning approaches exist. Some of them propose the use of natively designed beacons for localization (such as UWB, ultrasound, infrared, etc.). Alternatively other solutions try to explore ways to localize a person by making use of already existing infrastructure in buildings (e.g., WiFi access points, etc.), as well as, other signals available from the embedded sensors in a smartphone (magnetic, inertial, pressure, light, sound, GNSS, etc.). This smartphone-based unmodified-space approach has significant practical benefits such as ubiquity, low cost, as well as being a constantly-updated technology (growing number of AP, improved smartphones, etc.). Several instances of this "smartphone-based" localization approach have been described in the literature; however, there is a need for testing and comparing their performances (e.g., accuracy and robustness) under a common evaluation framework like this competition.

Competition Goal

The goal of this competition track is to evaluate the performance of different indoor localization solutions based on the signals available to a smartphone (such as WiFi readings, inertial measurements, etc…) and received while a person is walking along several regular unmodified multi-floor buildings.

Main features of the competition

Off-site competition approach

This track is done off-site, so all data for calibration is provided by competition organizers before the celebration of the IPIN conference. The competition teams can calibrate their algorithmic models with several files containing readings from sensors typically found in modern mobile phones and some ground-truth positions. Finally, each team will compete using additional files, but in this case, the ground-truth reference is not given and must be estimated by the competitors. This is an off-line competition where all competitors have the same data of the testing environment and custom on-site calibration is not allowed.

Multiple sources of information (novelty in 2021)

The multi-sensor data were captured at the Research Institutes Building of Universidad de Extremadura (Badajoz, Spain) in July 2021 and distributed into logfiles for training, validation and evaluation.

The BLE and WiFi RSS data (the most important sources of information for absolute positioning indoors) can be used to implement a fingerprinting localization method, as well as its magnetic data, while the inertial signals available at the phone can give important clues about the motion of a walking person. GPS information can be used if the user's trajectory is partially done outside (patio, main entrance,…). The pressure, sound and light data could also give some other clues about potential floor changes, or a particular discriminant sound/light intensity at some rooms.

Device Heterogeinity (novelty in 2021)

Training and validation data were collected by means of five modern smartphones with different features and Android OS versions, whereas data for evaluation was collected with just one of them. This approach enables competitors to exploit and integrate data collected with a different device than the device used in the evaluation.

In addition, five different users participated in the data collection. A user used the same smartphone in the whole data collection except for the logfiles related to the validation route V04.

- Samsung Note 9 (SM-N960F with Android 10) – User 1
- Samsung Note 10 (SM-N975F with Android 11) – User 2
- Samsung Galaxy A5 2017 (SM-A520F with Android 8.0.0) – User 3
- Samsung Galaxy S7 (SM-G930F with Android 8.0.0) – User 4
- Xiaomi Mi 10 Pro (Mi 10 Pro with Android 10) – User 5

All logfiles includes a header were the phone manufacturer, model and Android release are provided.

Continuous motion and recording process

While recording the logfiles with the smartphone, the person moved along a continuous trajectory passing by some known landmarks. Every time a person stepped on a known landmark, this ground truth position information was added to the logfile. Ground truth position can be used for calibrating competitor's algorithms. The length of each individual training and validation trajectory is a few minutes.

There is no guarantee that the trajectory between two consecutive landmarks will be a perfect straight line. Inertial sensors should be used to detect the displacements with more detail. **In the training logfiles, all significant turns have been recorded with a landmark. Please pay special attention to the validation logfiles, where turns, u-turns, stops and other challenging movements could be present between two consecutive landmarks. The supporting visualization maps for the validation logfiles only show the location of the landmarks and the lines only indicate their adjacency, not the real path.**

Realistic walking style

The person in charge of recording the logfiles moved in a natural and realistic way: most of the time walking forward, but occasionally stopping, sitting, taking large turns (90 or 180 degrees at corridor ends), simulating phone calls and messaging, and, even, moving backward or laterally at certain points (e.g., when giving way at door accesses). The change to different floors is only done through stairs.

Phone holding

The user always carried the smartphone on his hand, the user never put the smartphone on a backpack or a pocket. For the reference logfiles, the user always kept the smartphone (mostly) stable in front of his face or chest (typical position for reading or typing with the phone) as shown in the video. For validation and evaluation logfiles the user's movements are not that strict but they remain realistic. Although the user hold the device as in the training logfiles most of time, the user may leave the smartphone on a table and occasionally do other realistic movements, e.g. attending a phone call, answering a message or taping the screen to read recent notifications. Anyway, non-natural handling conditions are not expected.

Desired localization approaches

Any kind of positioning algorithm is admitted. In this competition, we strongly welcome:

- **Fingerprinting** approaches using WiFi RSS values, BLE RSS values, or Magnetic patterns. Competitors can use these data and the ground-truth position given in logfiles to calibrate their algorithms.
- **Multi-sensor fusion** algorithms trying to exploit, dynamic time-correlated information such as inertial data (for PDR or pedestrian dead-reckoning), and pressure/sound/illumination changes along each trajectory. For those competitors wishing to exploit this dynamic extra information, a potential benefit could probably be obtained over static fingerprinting.
- **Any other innovative approach.** The use of map information, or any other approach such as activity recognition (detecting states like going upstairs, in a lift, etc.), in order to complement the above-mentioned solutions are also acceptable.

Information from building

This year the competition takes place in the facilities of University of Extremadura (Badajoz, Spain). Multiple WiFi access points (AP) were registered in the logfiles, but the position of each AP is unknown. More than 30 BLE beacons were deployed in the environment to support indoor location. Several geo-referenced floor-map images are available; competitors are free to decide whether to use or not to use that information for positioning.

Description of Datasets (Logfiles)

Data Format

Each logfile is a "txt" file containing multiple rows with different types of data. Each row registers the data received from a particular sensor type in the phone at a given time. The stream of sensor data generated in the phone is stored, row by row, in the logfile in sequence as they are received. Each row begins with an initial header (4 capital letters followed by a semicolon, e.g., 'WIFI', 'ACC','MAGN', etc.) that determines the kind of sensor read, and several fields separated by semicolon with different readings. This is an extract of a real log file shown as example:

```
ACCE;5.050;10598.090;2.62405;7.80031;3.99832;3
AHRS;5.050;10598.090;53.015697;-25.520027;174.308365;0.21901685;0.42494810;0.86680275;3
ACCE;5.054;10598.095;2.68151;7.83622;4.09887;3
MAGN;5.054;10598.091;0.90000;-38.88000;2.10000;3
GYRO;5.055;10598.091;0.31093;-0.13073;1.29076;3
GYRO;5.058;10598.096;0.24740;-0.12523;1.31641;3
ACCE;5.058;10598.100;2.74854;7.80989;4.25928;3
AHRS;5.059;10598.100;52.890343;-26.576916;175.597595;0.22229716;0.42519289;0.86681318;3
ACCE;5.066;10598.105;2.84671;7.72609;4.57771;3
MAGN;5.066;10598.101;0.30000;-38.58000;2.34000;3
GYRO;5.067;10598.101;0.18143;-0.07575;1.34146;3
WIFI;5.067;10598.064;SSID_0001;20:20:00:00:00:01;2462;-62
WIFI;5.067;10598.064;SSID_0002;20:20:00:00:00:02;2462;-63
WIFI;5.067;10598.064;SSID_0001;20:20:00:00:00:13;2437;-77
WIFI;5.067;10598.064;SSID_0001;20:20:00:00:00:04;2462;-78
WIFI;5.067;10598.064;SSID_0002;20:20:00:00:00:10;2462;-79
WIFI;5.067;10598.064;SSID_0007;20:20:00:00:00:16;2412;-80
WIFI;5.067;10598.064;SSID_0011;20:20:00:00:00:33;2437;-80
WIFI;5.067;10598.064;SSID_0003;20:20:00:00:00:11;5600;-81
WIFI;5.067;10598.064;SSID_0006;20:20:00:00:00:15;2412;-81
WIFI;5.067;10598.064;SSID_0001;20:20:00:00:00:07;5240;-82
WIFI;5.067;10598.064;SSID_0002;20:20:00:00:00:08;5240;-82
WIFI;5.067;10598.064;SSID_0008;20:20:00:00:00:34;2427;-82
WIFI;5.067;10598.064;SSID_0001;20:20:00:00:00:35;2432;-82
WIFI;5.067;10598.064;SSID_0002;20:20:00:00:00:36;2412;-83
WIFI;5.067;10598.064;SSID_0002;20:20:00:00:00:05;2412;-84
WIFI;5.067;10598.064;SSID_0002;20:20:00:00:00:09;2412;-84
WIFI;5.067;10598.064;SSID_0012;20:20:00:00:00:37;5540;-84
WIFI;5.067;10598.064;SSID_0008;20:20:00:00:00:38;5520;-85
WIFI;5.067;10598.064;SSID_0013;20:20:00:00:00:39;5520;-85
WIFI;5.067;10598.064;SSID_0008;20:20:00:00:00:17;2417;-86
WIFI;5.067;10598.064;SSID_0001;20:20:00:00:00:18;2412;-87
WIFI;5.067;10598.064;SSID_0014;20:20:00:00:00:40;5520;-87
WIFI;5.067;10598.064;SSID_0015;20:20:00:00:00:41;5680;-87
WIFI;5.067;10598.064;SSID_0016;20:20:00:00:00:42;2462;-87
WIFI;5.067;10598.064;SSID_0002;20:20:00:00:00:23;5180;-88
WIFI;5.067;10598.064;SSID_0002;20:20:00:00:00:45;2412;-88
WIFI;5.067;10598.064;SSID_0002;20:20:00:00:00:26;2472;-89
WIFI;5.067;10598.064;SSID_0001;20:20:00:00:00:46;2412;-89
```

Figure 1. Log file example of the format used for sensor data registration. The registered measurements correspond to the time interval from 5.05 to 5.1 seconds (50 milliseconds). Data from 2020 Competition.

The detailed list of fields in each sensor's row, and one specific example, is shown next:

WIFI: the RSS (in dBm) received from a particular AP	
Format	WIFI;AppTimestamp(s);SensorTimeStamp(s);Name_SSID;MAC_BSSID;Frequency(Hz);RSS(dBm)
Example	WIFI;1.184;130.671;eduroam;00:0b:86:27:37:b0;2472;-91
MAGN: the local magnetic field, as measured by the 3-axis magnetometer in the phone	
Format	MAGN;AppTimestamp(s);SensorTimestamp(s);Mag_X(uT);;Mag_Y(uT);Mag_Z(uT);Accuracy(integer)
Example	MAGN;0.035;8902.708;-20.70000;-34.02000;-19.20000;3
ACCE: the phone's acceleration, as measured by the 3-axis accelerometers in the phone	
Format	ACCE;AppTimestamp(s);SensorTS(s);Acc_X(m/s^2);Acc_Y(m/s^2);Acc_Z(m/s^2);Accuracy(integer)
Example	ACCE;0.034;8902.708;-1.80044;6.41646;7.17303;3
GYRO: measures the phone's rotation, using the 3-axis orthogonal gyroscopes in the phone	
Format	GYRO;AppTimestamp(s);SensorTimestamp(s);Gyr_X(rad/s);Gyr_Y(rad/s);Gyr_Z(rad/s);Accuracy(int.)
Example	GYRO;0.032;8902.705;-0.22846;-0.21930;-0.05498;3
PRES: the atmospheric pressure	
Format	PRES;AppTimestamp(s);SensorTimestamp(s);Pres(mbar);Accuracy(integer)
Example	PRES;0.038;8902.726;956.4289;0
LIGH: for light intensity in Luxes	
Format	LIGH;AppTimestamp(s);SensorTimestamp(s);Light(lux);Accuracy(integer)
Example	LIGH;0.032;8902.693;292.0;0
SOUN: the sound pressure level in dB	
Format	SOUN;AppTimestamp(s);RMS;Pressure(Pa);SPL(dB)
Example	SOUN;0.248;594.57;0.01815;59.15
TEMP: the temperature in degrees Celsius.	
Format	TEMP;AppTimestamp(s);SensorTimestamp(s);temp(ºC);Accuracy(integer)
Example	TEMP;0.505;134.194;26.9;1
PROX: Proximity	
Format	PROX;AppTimestamp(s);SensorTimestamp(s);prox(1/0);Accuracy(integer)
Example	
HUMI: Humidity	
Format	HUMI;AppTimestamp(s);SensorTimestamp(s);humi(%);Accuracy(integer)
Example	HUMI;0.501;134.194;47.0;1
GNSS: the Latitude, Longitude and Height estimated from GPS/Glonass	
Format	GNSS;AppTimestamp(s);Latit(º);Long(º);Altitude(m);Bearing(º);Accuracy(m);Speed(m/s); UTCTime(ms);SatInView;SatInUse
Example	GNSS;0.611;40.313524;-3.483137;600.865;0.000;4.0;0.0;1358782729999; 17;15
AHRS: the mobile phone 3D orientation in terms of pitch, roll and yaw	
Format	AHRS;AppTS(s);SensorTS(s);PitchX(º);RollY(º);YawZ(º);RotVecX();RotVecY();RotVecZ();Accuracy(int)
Example	AHRS;0.033;8902.705;41.6550;11.7495;-124.0558;0.25038;-0.26750;-0.80406;-2
BLE4: Bluetooth Low Energy 4.0 data	
Format	BLE4;AppTS(s);Protocol;MAC Address; RSSI; Power; MajorID;MinorID;UUID
Example	BLE4;8.8800;iBeacon;CA:EF:C9:33:23:20;-79;0;33;2;21BEAC2F-0000-0000-0000-000000000000
POSI: ground-truth position (only in calibration files)	
Format	POSI;Timestamp(s);Latitude(degrees); Longitude(degrees);floor ID(0,1,2..4);Building ID(0,1,2..3)
Example	POSI; 0.0330;41.12245678,-3.12355678,2,0

Note that for most sensors there are two timestamps (both in seconds):

1. 'AppTimestamp' is set by the mobile App as data is read. It is not representative of when data is actually captured by the sensor (but it is in a time reference common to all sensors).
2. 'SensorTimestamp' is set by the sensor itself. The sampling interval is the difference between SensorTimestamp(k) and SensorTimestamp(k-1).
3. WIFI lines now include the frequency.
4. BLE includes MAC address, Major ID, Minor ID, and UUID for identification. Power may correspond to the default value for the power at 1m and should not be trusted.

The sampling rate of each type of sensor can be different from logfile to logfile, since it is dependent on the embedded sensor chips used by a particular phone. Typical sampling frequency values for the inertial data is about 50Hz, but we forced the sensor to the maximum rate. Pressure, Sound, Light sensors have a much lower update rate (<10Hz). WiFi scans are available approximately every 3.95 seconds (0.25 Hz).

Each logfile includes in its firsts rows (those starting with character '%') some informative text about the sensor data format, the date of recording and identification of the used phone (model and android version). The provided logfiles should be parsed by the competitor's teams in case they need to rearrange data into another preferred format. A parser in Matlab code is available in the supplementary materials to competitors want to use it to help to manipulate and rearrange data.

New in 2021:

- **All the logfiles include data of the BLE beacons deployed in the operational area. The beacon density and location depends on the particular subarea. All beacons share the same configuration to emit the BLE advertisements.**
- **The sampling rate has been limited to 100 Hz**
- **Wi-Fi and BLE data may behave differently depending on the smartphone. Please, have in mind that Wi-Fi data may not be trustable in the smartphones with Android 10 and Android 11.**

Important note: the key points (landmarks) are not publicly available in evaluation logfile and they will be inserted by the organizers using the timestamp in the submitted files. In Track 3, the data recording starts in apptimestamp 0. In the evaluation logfile, the apptimestamp 0 corresponds to 1626257042000 (Wed Jul 14 12:04:02 GMT+02:00 2021) in Unix Timestamp.

Calibration process for fingerprinting

It is known that Wi-Fi Fingerprinting methods require to be calibrated before being operative for localization. In order to do this calibration, the competitors should extract the ground-truth position within the logfile ('POSI' header) and get the WiFi readings closest in time to each reference landmark. Several logfiles are available for calibration, so each competitor should extract relevant information from the different logfiles.

Dataset types and download link

There are some datasets available for calibration: the **training** and **validation** logfiles. Both training and validation logfiles include reference ground-truth positions (lines with a "POSI" header, followed by Latitude, Longitude, floor ID and Building ID). The validation logfiles will be explicitly provided by the organizers, which should be used to have an initial estimation of the IPS accuracy.

- There are three types of training logfiles, the regular training logfiles, the auditorium training logfiles and the floor transition training logfiles. The regular training logfiles contain a path without any floor transition. The auditorium training logfiles were collected the auditorium which covers a large area with a soft floor transition (see Figure 2). The floor transition training logfiles includes a path with multiple floor transitions using the stairs.

- In the validation logfiles, the movement between keypoints is free, so the actor could have done non-rectilinear movement between POSI landmarks and visited unknown areas. The user may have done other realistic movements such as stopping, sitting, attending a phone call, among others.
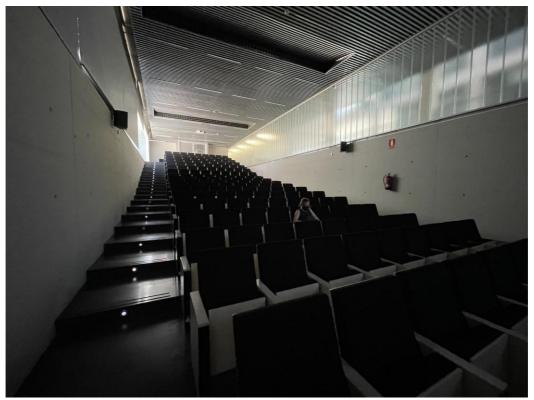

Figure 2. The Auditorium located in a space spanning 2 floors.

Another type of logfiles, the **evaluation** logfiles, are used for evaluation at the competition and do not contain any position reference (no 'POSI' header). These logfiles contain measurements were taken following the same procedure used in the training and validation logfiles. There is no guarantee that the users and/or phones involved in the evaluation participated in the training and validation data collection. The evaluation of the competitor's algorithm will rank its performance according to the metrics previously described in section "Evaluation criterion". In Track 3 of the 2021 IPIN competition, we only provide 1 evaluation logfile through the EvaalAPI https://evaal.aaloa.org/evaalapi/.

Sensor Calibration

All training and validation logfiles start with a calibration. First, the phone is arbitrary moved during around 15-30 seconds. Then, it remains static in from of user's face for around 15-30 additional seconds. After that, the first landmark is provided. A similar calibration procedure is done in the evaluation logfile.

Inputs given to competitors

The materials and methods provided by the competition organizers are:

- **Supplementary materials**

    o **Matlab Parser**

    o **Calibration Floormaps**

    o **Files for GetSensorData Matlab Tools**

    o **Visualization of the routes** using the map floors in raster format as reference

- **LogFiles** with ground-truth inserted (POSI lines):
    - Regular Training Logfiles – 9 routes
    - Auditorium Training Logfiles – 1 route
    - Floor transition Training Logfiles – 1 route
    - Validation Logfiles – 4 routes

- **LogFiles** without ground-truth:
    - Evaluation Logfiles – 1 route (single device) via https://evaal.aaloa.org/evaalapi/

- **Videos**:
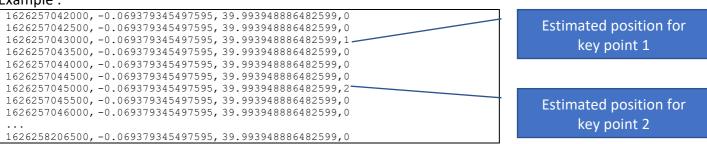   - 1 video showing how a training logfile was collected

Note: The supplementary materials are confidential and should be requested by the email to the competition chairs jtorres@uji.es and antonio.jimenez@csic.es . Re-distribution of the maps is not allowed out of the competing group who has requested them, not even inside the same organization.

Description of the Output

For each trial, you must submit your estimates with the EvaalAPI whose format is now described.
- 5 columns :
    - Column 1: Timestamp in ms
    - Column 2: WGS84 longitude in decimal degrees with at least 12 decimal digit resolution
    - Column 3: WGS84 latitude in decimal degrees with at least 12 decimal digit resolution
    - Column 4: Floor Number in integer (0: Ground Floor, 1, 2)
    - Column 5: index in integer (key point number from 1 to N. 0 represents no landmark. Each specific integer represents the specific key point)
- Comma (“,”) used as data delimiter
- No header
- Track3 requirement: frequency 2 Hz synchronized with the beginning of the evaluation trajectory.
- Track3 requirement: The first estimation is on Timestamp 1626257042000, that corresponds to apptimestamp 0 in the evaluation logfile
- Track3 requirement: The column 5 for the key point number must be filled with 0, the organizers will add the key points indexes
- Track3 requirement: Please provide your estimates until the last record in the evaluation logfile record: 1626258206500 (apptimestamp 1164.5)

Example :

```
1626257042000, -0.069379345497595, 39.993948886482599,0
1626257042500, -0.069379345497595, 39.993948886482599,0
1626257043000, -0.069379345497595, 39.993948886482599,1
1626257043500, -0.069379345497595, 39.993948886482599,0
1626257044000, -0.069379345497595, 39.993948886482599,0
1626257044500, -0.069379345497595, 39.993948886482599,0
1626257045000, -0.069379345497595, 39.993948886482599,2
1626257045500, -0.069379345497595, 39.993948886482599,0
1626257046000, -0.069379345497595, 39.993948886482599,0
...
1626258206500, -0.069379345497595, 39.993948886482599,0
```

Estimated position for key point 1

Estimated position for key point 2

Evaluation will only take into account the estimated position at each indexed key point position, so that each track is considered as a series of key point positions (from 1 to N).

Evaluation criterion

The final metric will be based on the accuracy for the correct floor detection and the horizontal positioning error. In particular, the score for comparing the different location systems will be based on the following equations:

Accuracy Score = 3rdQuartile{SampleError(R_i, E_i)}, $\forall$ groundtruth reference in all final test sets

SampleError(R_i, E_i) = Distance(R_i, E_i) + (penalty × floorfail)

where:
- "3rdQuartile" is the third quartile error, in meters, of a cumulative error distribution function, i.e., the error value that includes 75% of estimations (sample errors) with a lower error.
- R_i is the actual position (ground truth).
- E_i is the predicted position by the method proposed by the contest participant.
- floorfail is the absolute difference between actual floor and the predicted one.
- penalty is used to penalize errors in estimating the floor. penalty is set to 15 m.
- Distance(R_i, E_i) calculates the Euclidean distance between coordinates (longitude and latitude) of R_i and E_i.

The team with the lower "Accuracy Score" wins.

Useful datasets and baselines

The IPIN 2021 Competition (Track 3, Smartphone-based off-site) is using the same log file structure (with minor changes) structure since 2016. The full datasets and competition results are publicly available for those research teams and developers interested in evaluating their solutions on them:

- https://zenodo.org/record/4314992
- https://zenodo.org/record/3606765
- https://zenodo.org/record/2791530
- https://zenodo.org/record/2823924
- https://zenodo.org/record/2823964
- Potortì, F.; Torres-Sospedra, J.; Quezada-Gaibor, D.; Jiménez, A.R.; Seco, F.; Pérez-Navarro, A.; Ortiz, M. et al. Off-line Evaluation of Indoor Positioning Systems in Different Scenarios: The Experiences from IPIN 2020 Competition IEEE Sensors Journal, Early Access (in press), 2021. https://doi.org/10.1109/JSEN.2021.3083149
- Potorti, F.; Park, S.; Palumbo, F.; Girolami, M.; Barsocchi, P.; Lee, S.; Torres-Sospedra, J.; Jimenez Ruiz, A. R.; et al. The IPIN 2019 Indoor Localisation Competition - Description and Results IEEE Access Vol. 8, pp. 206674-206718, 2020. https://doi.org/10.1109/ACCESS.2020.3037221
- Renaudin, V.; Ortiz, M.; Perul, J.; Torres-Sospedra, J.; Ramón Jimenez, A.; Pérez-Navarro, A.; et al. Evaluating Indoor Positioning Systems in a Shopping Mall: The Lessons Learned from the IPIN 2018 Competition IEEE Access Vol. 7, pp. 148594--148628, 2019. http://dx.doi.org/10.1109/ACCESS.2019.2944389

- Torres-Sospedra, J.; Jiménez, A. R.; Moreira, A.; Lungenstrass, T.; Lu, W.-C.; Knauth, S.; Mendoza-Silva, G.M.; Seco, F.; Perez-Navarro, A.; Nicolau, M.J.; Costa, A.; Meneses, F.; Farina, J.; Morales, J.P.; Lu, W.-C.; Cheng, H.-T.; Yang, S.-S.; Fang, S.-H.; Chien, Y.-R. and Tsao, Y. Off-line evaluation of mobile-centric Indoor Positioning Systems: the experiences from the 2017 IPIN competition Sensors Vol. 18(2), 2018. http://dx.doi.org/10.3390/s18020487

- Torres-Sospedra, J.; Jiménez, A.; Knauth, A.; Moreira, A.; Beer, Y.; Fetzer, T.; Ta, V.-C.; Montoliu, R.; Seco, F.; Mendoza, G.; Belmonte, O.; Koukofikis, A.; Nicolau, M.J.; Costa, A.; Meneses, F.; Ebner, F.; Deinzer, F.; Vaufreydaz, D.; Dao, T.-K.; and Castelli, E. The Smartphone-based Off-Line Indoor Location Competition at IPIN 2016: Analysis and Future work Sensors Vol. 17(3), 2017. http://dx.doi.org/10.3390/s17030557

Note: The datasets collected for the previous competitions correspond to evaluation areas in research centers in Spain, a Shopping Mall in France, and the CNR center in Pisa (Italy), a Library building in Castellón (Spain). This year, due to the current health situation, the evaluation area is a research center in Badajoz (Spain) and the operational area is restricted to the main ground floor and part of the basement. All data was collected according to the strict protocol because the COVID-19 situation.

GetSensorsData Suite and Tools

The GetSensorsData Suite is available to the community for its usage and improvement. The full description of the application used to collect the data, as well to get the calibrated maps, can be found below.

- Jiménez-Ruiz, A. R.; Seco, F.; and Torres-Sospedra, J. Tools for smartphone multi-sensor data registration and GT mapping for positioning applications Proceedings of the Tenth International Conference on Indoor Positioning and Indoor Navigation, 2019. http://dx.doi.org/10.1109/IPIN.2019.8911784

Please, get involved in the development of this evaluation framework and provide us your contributions through the GetSensorsData Suite GitHub project.
https://gitlab.com/getsensordatasuite

Contact points and information

For any further question about the database and this competition track, please contact to:
Joaquín Torres (jtorres@uji.es) at Institute of New Imaging Technologies, Universitat Jaume I, Castellón, Spain. Please carbon copy (CC) also to Antonio R. Jiménez (antonio.jimenez@csic.es) at the Centre of Automation and Robotics (CAR)-CSIC/UPM, Madrid, Spain and Antoni Pérez-Navarro (aperezn@uoc.edu) at Universitat Oberta de Catalunya (UOC).

Introduced changes

Version 1.01   September 1ˢᵗ   Initial Submission