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Track 3 "Smartphone (Offsite-Online)"

Organizational aspects:

Database/dataset download

- As in the previous editions, the full dataset is split into three subsets as usual: training, testing and scoring.
    - **Training data**, which are provided as off-line files and are used to calibrate the system (former training logfiles).
    - **Testing trials**, which are provided through the EvaalAPI and are reloadable. Competitors can run them as many times as they like to evaluate and fine-tune their system as well as to get used to the EvaalAPI (former validation logfiles)
    - Scoring trials, which are provided through the EvaalAPI and are non-reloadable. Those are used to evaluate the competitors and can be run only once (former evaluation logfiles).
- Training, testing and scoring datasets were recorded with Android smartphones and they have been stored in txt logfiles. Training data are provided as txt files (logfiles), whereas testing and scoring data are provided by means of the EvaalAPI respectively as testing trials (reloadable) and scoring trials (non-reloadable).
- In order to run a trial in the EvaalAPI, competitors have to ask info@evaal.aaloa.org for a trial code.

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, we rely on the 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 run the evaluation process up to **2 times**. This lets a chance to catch-up if any issues happen. Although the competition organizers will evaluate the **two scoring trials**, the contest will consider only the best performing one. These two scoring trials may correspond to two different data collection sessions collected with different smartphones and actors.
- All materials will be available online in Zenodo after the competition.

NOVELTIES 2025:

- The location for the competition is new, being a campus facility in Tampere (Finland)
- Maps may not be fully available
- We have updated the GetSensorsData APP to be compatible with recent smartphones
- We will provide the starting point for the Scoring Trials within the EvAAL API

Submission deadline of the post-processed indoor coordinates

- Training data available in the website: **7 July 2025**
- Testing trials (validation, reloadable & non reloadable) available in EvaalAPI: **7 July 2025**
- Application deadline: **31 August 2025**
- Scoring trials (evaluation, non-reloadable) available in EvaalAPI: **8-10 September 2025**
- Proclamation of winners: **18 September 2025**

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.).

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, BLE, 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 (training data and testing trials) 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 environment and custom on-site calibration is not allowed. Wi-Fi RSS data and BLE iBeacon data have been anonymized.

Continuous motion and recording process

While recording the trial's data with the smartphone, the person moved along a continuous trajectory passing by some known landmarks. Every time a person stepped on a known landmark, we saved this ground truth position information in the logfile. Ground truth position can be used for calibrating competitor's algorithms. The length of each individual training and testing trial is a few minutes.
There is no guarantee that the trajectory between two consecutive landmarks will be a perfect straight line. In the training data, all significant turns have been recorded with a landmark. Please pay special attention to the testing/scoring trials, where turns, U-turns, stops and other challenging movements could be present between two consecutive landmarks. The supporting visualization maps for the testing trials 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 trial 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). In the testing and scoring trials, we have performed some challenging movements to test the robustness of the evaluated system. Floor commuting is preferably, but not limited, through stairs.

Phone holding

The user always carried the smartphone in a realistic way resembling a real situation. For the training trials, 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 testing and scoring trials the user's movements are not that strict, but they remain realistic. Although the user holds the device as in the training trials 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, extreme non-natural handling conditions are not expected.

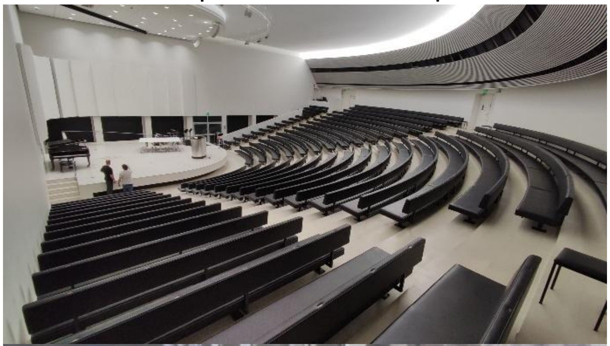
Desired localization approaches

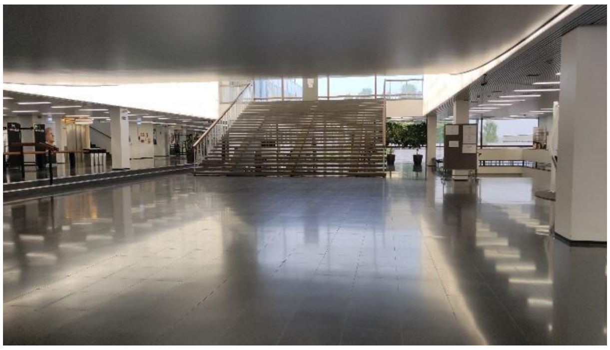
Any kind of positioning algorithm is admitted. In this competition, we strongly welcome:

- **Fingerprinting and proximity** approaches using WiFi RSS values, BLE RSS values, or Magnetic patterns. Competitors can use these data and the ground-truth position given in training trials 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.

Novelties in 2025

- Data has been collected only with two smartphones by several actors;
- Environment is composed by a large 6-storey building located in the city center campus of Tampere University;
- Some classrooms/auditoriums span multiple floors and have entries/exits at different levels;
- We included information about all recorded BLE beacons, however weak signals have not been recorded by the GetSensorData application.
- The format for BLE has been changed to include iBeacon, Eddystone and Custom BLE advertisements.
- The sampling rate has been set to 50 Hz
- We provide the initial position for the Testing and Scoring Trials within the EvAALAPI framework.





Description of Datasets (Logfiles/Trials)

Data Format

We use the same fata format as in the previous edition. Each logfile or trial is a "txt" file containing multiple rows with different types of data. For the training data, the txt files are provided "as is" and can be directly downloaded from the EvAAL website. For the testing and scoring trials, data is streamed using the EvaalAPI. 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', 'ACCE','MAGN', etc.) that determines the kind of sensor read, and several fields separated by semicolon with different readings. Examples of the logfiles can be found in the technical annex for competitions 2016—2024.
Note that for most sensors there are two timestamps (both in seconds):

- '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).
- 'SensorTimestamp' is set by the sensor itself. The sampling interval is the difference between SensorTimestamp(k) and SensorTimestamp(k-1).
- BLE includes now three protocols!

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.
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
MAGU: Uncalibrated local magnetic field, as measured by the 3-axis magnetometer in the phone	
Format	MAGU;AppTimestamp(s);SensorTimestamp(s);Mag_X(uT);bias_X(uT);Mag_Y(uT);bias_Y(uT);Mag_Z(uT);bias_Z(uT);Acc (integer)'
Example	MAGU;0.062;32070.265;-50.34000;-44.46000;-30.06000;-8.10000;-48.48000;-28.26000;3
STEP: Step detector based on acceleration and internal android-based estimation	
Format	STEP;AppTimestamp(s);SensorTimestamp(s);StepCount(integer)
Example	STEP;7.107;32077.376;1
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
GNSR: GNSS RAW data, including pseudoranges, doppler, time references, etc.	
Format	GNSR;AppTimestamp(s);utcTimeMillis(ms);TimeNanos(ns);LeapSecond;TimeUncertaintyNanos(ns);FullBiasNanos(ns); BiasNanos(ns); BiasUncertaintyNanos(ns);DriftNanosPerSecond(ns/s);DriftUncertaintyNanosPerSecond(ns/s); HardwareClockDiscontinuityCount;Svid; TimeOffsetNanos(ns);State;ReceivedSvTimeNanos(ns); ReceivedSvTimeUncertaintyNanos(ns);Cn0DbHz(dB-Hz); PseudorangeRateMetersPerSecond(m/s); PseudorangeRateUncertaintyMetersPerSecond(m/s);AccumulatedDeltaRangeState;AccumulatedDeltaRangeMeters(m); AccumulatedDeltaRangeUncertaintyMeters(m);CarrierFrequencyHz(Hz);CarrierCycles;CarrierPhase; CarrierPhaseUncertainty;MultipathIndicator;SnrInDb(dB);ConstellationType;AgcDb(dB);BasebandCn0DbHz(dB- Hz);FullInterSignalBiasNanos(ns);FullInterSignalBiasUncertaintyNanos(ns);SatelliteInterSignalBiasNanos(ns); SatelliteInterSignalBiasUncertaintyNanos(ns);CodeType;ChipsetElapsedRealtimeNanos(ns)
Example	GNSR;1.621;1749035966038;182044668000000;18;0; -1432889138744835411; 0.36035633087158203;30.43575998162850700;-16.16102701898012000;9.44327061389558300; 139;1;0.000;16399;299983333883716;9;40.4;-662.94097900390620000;0.01130919344723225;16; 0.000;0.000;1575420032.0;-1;-999.000;-1.000;0;0.000;1;-1.000;35.400;0.000;0.000;0.000;0.000;C;-1.000"
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 Protocol: Eddystone; CustomBLE; or iBeacon
Example	BLE4;0.261;Eddystone;20:25:B0:00:00:01;-87;2147483647;;00000000-0000-BEAC-2025-000000000001 BLE4;0.521;CustomBLE;20:25:B0:00:00:07;-91;0;5375;00000000-0000-BEAC-2025-000000000002 BLE4;218.196;iBeacon;20:25:B0:00:02:37;-90;256;-19681;00000000-0000-BEAC-2025-000000000062 Caution: there can be empty elements depending on the protocol
POSI: ground-truth position (only in training and testing trials, not present in scoring trials)	
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

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 data** and the **testing trials**. Both training data and testing trials include reference ground-truth positions (lines with a "POSI" header, followed by Latitude, Longitude, floor ID and Building ID). While the training data are available as off-line txt files, the testing trials are provided by the organizers through the EvaalAPI, which should be used to have an initial estimation of the IPS accuracy on four simple trajectories.

- The training logfiles usually contain a short path and may contain (or not) a floor transition. Generally, the path between two consecutive POSI landmarks in the same floor is a straight line, but a perfect linear movement is not guaranteed.
- In the testing trials, 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, taking an elevator, among others. The testing trials are provided through the EvaalAPI and are reloadable. i.e. the competitors can access to them and provide the position estimated many times. **These are useful to preassess your IPS.**

Another type of trials, the **scoring** trials, are used for evaluation at the competition and do not contain any position reference (no 'POSI' header). These trials contain measurements that were taken following the same procedure used in the training and testing trials. There is no guarantee that the users and/or phones involved in the evaluation participated in the training and testing data collection. The evaluation of the competitor's algorithm will rank its performance according to the metrics described in section "Evaluation criterion". In Track 3 of the 2025 IPIN competition, **we provide two scoring trials** through the EvaalAPI https://evaal.aaloa.org/evaalapi/. Users have just one attempt to submit the position estimates for each scoring trial. i.e., competitors can only run once each of the two scoring trials.

Sensor Calibration

All training logfiles and testing trials start with a calibration. First, the phone is arbitrary moved during around 20-40 seconds. Then, it remains static in from of user's face for around 20-40 additional seconds. After that, the first landmark is provided. A similar calibration procedure is done in the scoring trials.

Smartphones and actors

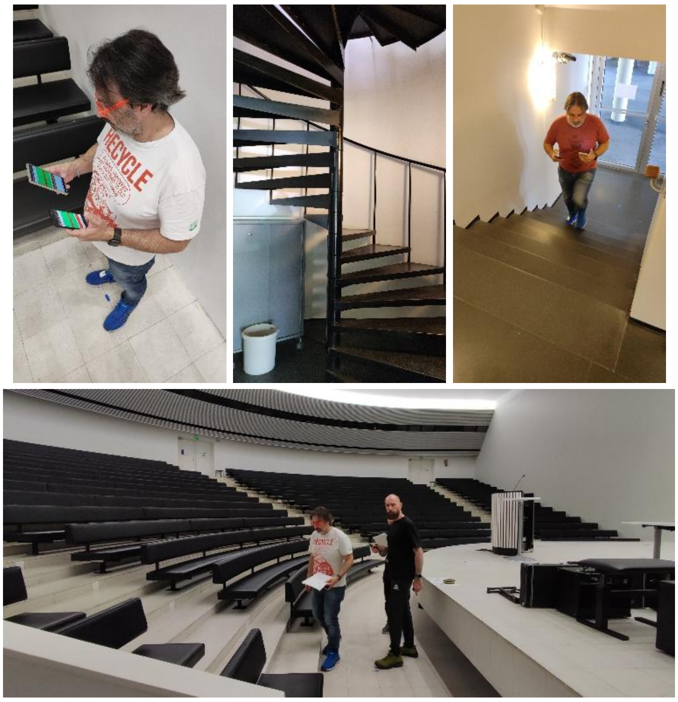
Two actors collected all the logfiles and trials for training, testing and scoring. The protocols for data collection were the same for both actors, but having slightly different natural poses, ways to hold the smartphone and step length. The smartphones used were a Samsung A5 2017 (SM-A520F with Android 8.0.0) and a Samsung S24 Ultra 5G (SM-S928Bwith Android 15).

Novelties in 2025

- Training data has been collected simultaneously by one actor;
- There are no subtypes of training data.
- Testing and Scoring trials might have been collected by different actors;
- All BLE data has been included with signal strength larger than 100 dBm;
- The sampling rate has been set to 50 Hz in contrast to 100 Hz as in 2022;
- Reference data for Level 1 is not included but may be visited in testing and scoring trials;

Information from building

We collected all data for Track 3 in the City Centre Campus of Tampere University. The Päätalo building has several entries in floors 2, 3 and 4, with large open areas and multiple level scenarios.



Inputs given to competitors

The materials and methods provided by the competition organizers are:

- Supplementary materials (upon request to Track Hairs)
    - Low Resolution Floormaps (to be confirmed)
    - Files for GetSensorData Matlab Tools
    - Visualization of the routes (to be confirmed)
- **Training Logfiles** with ground-truth inserted (POSI lines):
    - Training logiles: 72 logifiles with this file name format
        - IPIN2025_T3_TrainingTrialXY_sessionZ_P
          Where X is the floor for the initial position in the logfile, Y is the route number starting on the same floor, Z is the session (1 or 2), and P is the phone (SA52 or SG24)
        - There might be floor transitions within the logfiles
    - Link: https://competition.ipin-conference.org/current-competition/data
- **Testing trials** with ground-truth inserted (POSI lines):
    - Testing trials – 2 testing trials
    - Trials will be reloadable and non-reloadable with same restrictions as scoring trials
    - Link: https://evaal.aaloa.org/evaalapi/ (Europe) and https://120.77.98.217/evaalapi/ (Asia)
- **Scoring trials** (non-reloadable) without ground-truth:
    - Scoring Logfiles – 2 routes
    - Link: https://evaal.aaloa.org/evaalapi/ (Europe) and https://120.77.98.217/evaalapi/ (Asia)

Note: The supplementary materials are confidential and should be requested by the email to the competition chairs Joaquin.Torres@uv.es, ***antonio.jimenez@csic.es***, ***aperezn@uoc.edu*** .
Maps may be not available and their re-distribution (if available) 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 for the position estimate is:

- 3 columns :
  - Column 1: WGS84 longitude in decimal degrees with at least 12 decimal digit resolution
  - Column 2: WGS84 latitude in decimal degrees with at least 12 decimal digit resolution
  - Column 3: Floor Number in integer (from 1 to 6)
- Comma (“,”) used as data delimiter
- No header
- Track3 requirement: frequency 2 Hz synchronized with the beginning of the scoring trial (apptimestamp 0) until the last record in each of the scoring trials.
- Use 0,0,0 for those cases where you cannot estimate the coordinates (avoid use nan, NaN, N/A or other terminology).

Example :

```
0,0,0
23.779576369568,61.493888429177,4
23.779576369525,61.493888429187,4
23.779576369521,61.493888429200,4
23.779576369589,61.493888429171,4
23.779576369564,61.493888429121,4
23.779576369510,61.493888429203,4
23.779576369512,61.493888429333,5
23.779576369589,61.493888429222,5
23.779576369589,61.493888429222,6
...
23.779576369589,61.493888429222,1
```

For additional information, please visit the EvaalAPI documentation.

- https://evaal.aaloa.org/evaalapi/
- https://evaal.aaloa.org/evaalapi/demo-auto.out

or the mirror hosted in Asia

- https://120.77.98.217/evaalapi/

Evaluation criterion

The best accuracy score of the three scoring trials will be taken for final score, the team with lowest final score will be the winner

The accuracy score for a particular scoring trial is provided by the following equations:

Accuracy Score = 3rdQuartile{SampleError(R_i, E_i)}, ∀ reference location in the scoring trial
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 (lon and lat) of R_i and E_i.

Useful datasets and baselines

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

- 2024 https://zenodo.org/records/13931118 (same training and testing trials as in 2023!)
- 2023 https://zenodo.org/records/8362205 (same training and testing trials as in 2024!)
- 2022 https://zenodo.org/records/7612914
- 2021 https://zenodo.org/records/5948678
- 2020 https://zenodo.org/records/4314992
- 2019 https://zenodo.org/records/3606765
- 2018 https://zenodo.org/records/2791530
- 2017 https://zenodo.org/records/2823924
- 2016 https://zenodo.org/records/2823964

Previous papers describing the competitions 2016-2022 are available in:

- Potortì, F.; Crivello, A.; Lee, S.; Vladimirov, B.; et al. Offsite evaluation of localization systems: criteria, systems and results from IPIN 2021-22 competitions IEEE Journal of Indoor and Seamless Positioning and Navigation Vol. 2, 2024. https://doi.org/10.1109/JISPIN.2024.3355840
- 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

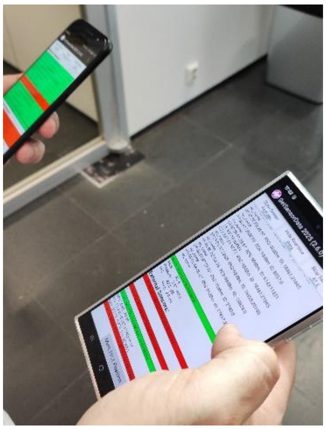
Note: The datasets collected for the previous competitions correspond to evaluation areas in research centers in Arganda del Rey, Alcalá de Henares, Castellón and Badajoz (Spain), a Shopping Mall in Nantes (France), the CNR center in Pisa (Italy), a Library building in Castellón (Spain) and the School of Engineering in Guimarães (Portugal). Bear in mind that the training and testing trials for 2024 correspond to 2023! In 2025 we moved to a campus facility in Tampere (Finland).

GetSensorsData Suite & Tools

An **initial GetSensorsData Suite repository** (https://gitlab.com/getsensordatasuite), now **deprecated**, was made available to the community for its usage and improvement. The full description of the application used to collect the data, as well as to obtain the calibrated maps, can be found below:

- Gutiérrez, J.D.; Jiménez, A.R.; Seco, F.; Álvarez, F.J.; Aguiler, T.; Torres-Sospedra, J.; Melchor, F.; GetSensorData: An extensible Android-based application for multi-sensor data registration SoftwareX (Elsevier) 19, 2022. https://doi.org/10.1016/j.softx.2022.101186
- 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

New GetSensorData App Version



A **new version of the GetSensorData App** (June 2025 version), which was specifically used for data collection in the IPIN 2025 Track 3 competition, is now available. This version is **compatible with modern Android phones** (from API 28 to 35; Android 9 to 15) and can be downloaded, cloned, and contributed to from a new repository: https://gitlab.com/getsensordatatools.

This new 2025 GetSensorData App version now includes registration of **RAW GNSS data**, **uncalibrated Magnetometers**, **step counts**, and several **improvements for permission handling**, as required by newer Android versions.
We encourage you to **get involved in the development** of this new GetSensorData App and provide your contributions through the **GetSensorsDataTools GitLab project**, which you can clone and update from the following links:

- https://gitlab.com/getsensordatatools/getsensordata_android.git
- git@gitlab.com:getsensordatatools/getsensordata_android.git

If needed ask for permission to Antonio Jiménez (antonio.jimenez@csic.es).

Contact points and information

For any further question about the database and this competition track, please contact to:
Joaquín Torres (Joaquin.Torres@uv.es; info@jtorr.es) at Universitat de València, València, Spain. Please carbon copy (CC) also to Antonio R. Jiménez (antonio.jimenez@csic.es) at the Centre for Automation and Robotics (CAR) CSIC-UPM, Madrid, Spain and Antoni Pérez-Navarro (aperezn@uoc.edu) at Universitat Oberta de Catalunya, Barcelona, Spain.

Introduced changes

Version 1	May 23rd	Preliminary Technical Annex
Version 2	July 7th	First version, description of the challenge