

Track4 "Foot-Mounted IMU based Positioning (off-site)" special features

Organizational aspects:

Database/dataset access

- This year we decided to change a little bit rules: even if Track4 is still an off-site track, we will ask to competitors to process data as if they were in real time. To do so, a new interface based on a web API has been developed: EvaalAPI. This API will be used by competitors for sending position estimates and reading the sensor readouts:
<https://evaal.aaloo.org/evaalapi/>
- In the context of this new EvaalAPI framework, two sessions (session1 and session2 described later) are proposed to competitors. Each of these sessions will be usable only once. Competitors have thus two trials, for the evaluation.
- In order to help competitors to be prepared for the evaluation, a "TrialDataSet" is proposed. This TrialDataSet contains all session1 data up to KeyPoint#2, and is fully accessible or reloadable (ie not restricted to a single usage as whole session1 and session2). The GroundTruth position of KeyPoint#1 and KeyPoint#2 are included in the TrialDataSet under the POSI label, for validation purpose.
- Participants can still download data usable for sensors bias estimation. Files will be accessible at the following URL:
<http://evaal.aaloo.org/images/2021/track4/>
- For information, competitors can find training datasets of previous Track4 edition on Zenodo:
IPIN2018-Track4: <https://zenodo.org/record/3228012>
IPIN2019-Track4: <https://zenodo.org/record/3937220>
IPIN2020-Track4: <https://zenodo.org/record/4668618>

Submission of the processed results

- As mentioned earlier, results have to be submitted via a web API. See above.
- A participant team can run the process up to 2 times. This lets a chance to catch-up if any issues happen. Although the competition organizers will evaluate the two trials, only the best one will be considered for the contest. For the first evaluation, dataset of session1 will be used. For the second trial, dataset of session2 will be used. These two datasets correspond to two different data collection performed on the same path but not at the same time.

Important deadlines:

- **Datasheet, some useful LogFiles and GNSS files** will be published the: **OCTOBER 4th 2021**
- **Trials and evaluation sessions will be accessible through web API** the: **coming soon**
- **The deadline** for submitting the post-processed results is: **NOVEMBER 18th 2021**
- Proclamation of winners: **DECEMBER 2nd 2021**

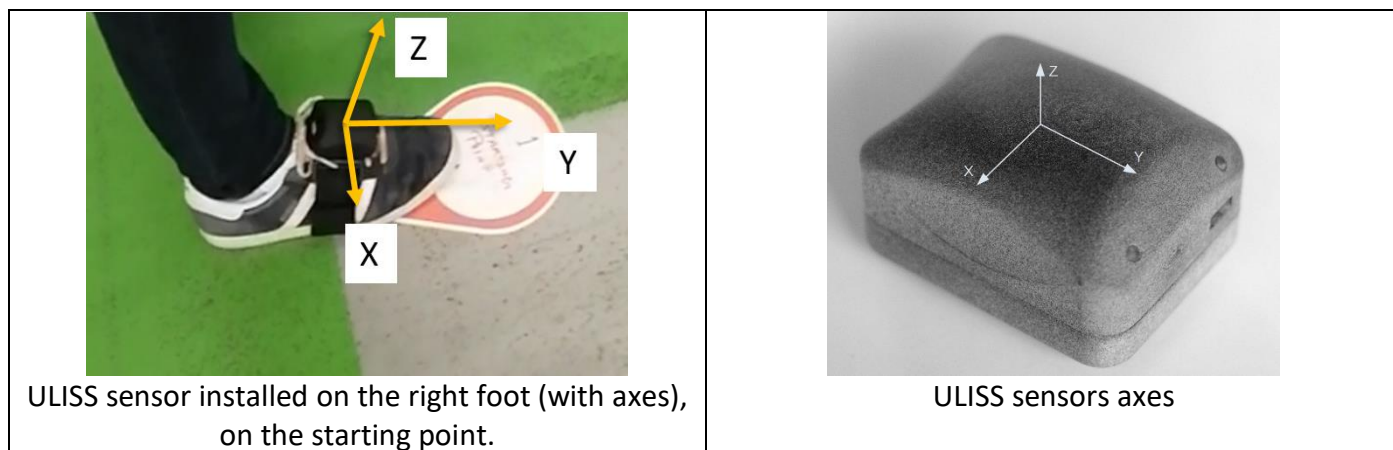
Scope

Many indoor navigation systems have been developed for pedestrians and assessing their performances is a real challenge. Benefiting from a reference solution that is accurate enough to evaluate other indoor navigation systems and assist novel research is of prime interest. According to ISO18305:2016 two different ways can be used for assessing indoor localization system: "Off-line surveyed test point" that is commonly used, or "reference system" with an accuracy at least one order of magnitude better the system you want to test. The scope of this track4 is clearly focused on the second way of assessing.

This track4 is based on the same material as previous competitions hold during IPIN2018, IPIN2019 and IPIN2020.



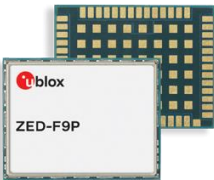
Competition Goal

The goal of this competition is to evaluate how good up-to-date INS algorithm is. Each competitor will have access to a dataset logged with ULISS (Ubiquitous Localization with Inertial Sensors and Satellites), a state-of-the-art Inertial Navigation System producing IMU data, MAG data, PRESSURE data & GNSS data, without the help of any maps.



Description of Datasets

Data is recorded from 3 different sensors:

<p>Xsens Mti-7</p> 	<p>IMU-Mag sensor: -3D accelerometer -3D gyrometer -3D magnetometer</p> <p>https://www.xsens.com/mti-7</p>
<p>BMP280 sensor</p> 	<p>Operation range: Pressure: 300...1100 hPa Absolute accuracy : $\sim \pm 1$ hPa Relative accuracy : ± 0.12 hPa (typical)</p> <p>https://www.bosch-sensortec.com/products/environmental-sensors/pressure-sensors/bmp280/</p>
<p>Ublox ZED-F9P dual freq. receiver</p> 	<p>Multi GNSS Receiver : BeiDou, Galileo, GLONASS, GPS / QZSS Number of concurrent GNSS 4 Dual GNSS Bands : L1C/A, L2C, L1OF, L2OF, E1B/C, E5b, B1I, B2I</p> <p>https://www.u-blox.com/en/product/zed-f9p-module</p>

Unit and meaning of the sensors outputs of ULISS are the following ones:

Column	Xsens MTi-1 (accelerometer)	Comments
1	Acceleration label	"ACCE"
2	GPS Time of Week (ToW) in second	GPS Time of Week (ToW) in second
3	Acc X (m/s^2)	
4	Acc Y (m/s^2)	

5	Acc Z (m/s ²)
---	---------------------------

Sample strings for accelerometer data

```
ACCE,314410.003952000,-1.25709,-4.34142,8.75831
ACCE,314410.008947000,-1.23771,-4.28408,8.72497
ACCE,314410.013942000,-1.26714,-4.3795,8.72491
ACCE,314410.018937000,-1.26167,-4.29823,8.71566
ACCE,314410.023932000,-1.25662,-4.26479,8.71095
```

Column	Xsens MTi-1 (gyrometer)	Comments
1	Gyrometer label	"ROTA"
2	GPS Time of Week (ToW) in second	GPS Time of Week (ToW) in second
3	Gyro X (rad/s)	
4	Gyro Y (rad/s)	
5	Gyro Z (rad/s)	

Sample strings for gyrometer data

```
ROTA,314410.004573000,0.00275338,-0.000805736,0.006387
ROTA,314410.009578000,-0.00576329,-0.00401807,0.00535798
ROTA,314410.014582000,0.00813067,0.00989926,0.00747764
ROTA,314410.019587000,0.00594413,-0.00079453,0.00529695
ROTA,314410.024591000,0.00488472,0.00237882,0.0117271
```

Column	Xsens MTi-1 (magnetometer)	Comments
1	Magnetometer label	"MAGN"
2	GPS Time of Week (ToW) in second	GPS Time of Week (ToW) in second
3	Mag X (a.u.)	a.u. = arbitrary unit according to Xsens.
4	Mag Y (a.u.)	Tips : multiply by 0.49*1000,
5	Mag Z (a.u.)	In order to get milliGauss (mG)

Sample strings for magnetometer data

```
MAGN,314410.005162000,0.224368,0.435266,-1.14962
MAGN,314410.015162000,0.22387,0.434764,-1.14766
MAGN,314410.025162000,0.222876,0.438141,-1.1481
MAGN,314410.035162000,0.223393,0.433828,-1.14817
MAGN,314410.045162000,0.224333,0.431291,-1.1413
```

Column	BMP280 (pressure)	Comments
1	Pressure sensor label	"PRES"
2	GPS Time of Week (ToW) in second	GPS Time of Week (ToW) in second
3	Pressure (Pa)	

Sample strings for pressure data

```
PRES,314410.005162000,101144
PRES,314410.025162000,101152
PRES,314410.045162000,101138
PRES,314410.065162000,101151
PRES,314410.085162000,101151
```

Column	Temperature (temperature)	Comments
1	Temperature sensor label	"TEMP"
2	GPS Time of Week (ToW) in second	GPS Time of Week (ToW) in second
3	Temperature (Degree Celsius)	

Sample strings for temperature data

```
TEMP,314410.025162000,44.1914
```

```
TEMP, 314411.025162000, 44.1758
TEMP, 314412.025162000, 44.1758
```

Column	Ublox F9P GNSS receiver (SBS)	Comments
1	GNSS SBAS information label	“GSBS”
2	GPS Time of Week (ToW) in second	GPS Time of Week (ToW) in second
3	Hexadecimal WORD	Corresponds to EGNOS SBAS Message Format*

*: https://gssc.esa.int/navipedia/index.php/The_EGNOS_SBAS_Message_Format_Explained

Sample strings for SBS (SBAS – EGNOS) data

```
GSBS, 315499, 9A494C00000000000000400001F00003F80003FC0003FE0001FF0001FF80
GSBS, 315618, 5363FBFFDC000000000000197BBAA01848160A0580B185BFDFEF980900
GSBS, 315619, 9A0A8003FE4027FFBFC7FEFFD4003FEC000003FB8003959559797BA380
```

Column	Ublox F9P GNSS receiver (SBS)	Comments
1	GNSS Observation label	“GOBS”
2	GPS Time of Week (ToW) in second	GPS Time of Week (ToW) in second
3	Observation data	Observation file based on RINEX 3.04 format http://rtcm.info/RINEX_3.04.IGS.RTCM_Final.pdf Only data after header* is used in the context of IPIN2021-Track4.

*Header of “OBSERVATION DATA” file under Rinex 3.04 format are given later in each session specific parts (headers are slightly different).

Sample strings for OBS (observation file, based on RINEX 3.04 format) data

```
GOBS, 314856.199000000, G04 24066762.037 8 126471694.10925 -3666.900 39.000
GOBS, 314856.199000000, G09 21204418.682 8 9 -2579.258 24.000
GOBS, 314856.199000000, G06 21843663.561 9 9 -3361.335 14.000
GOBS, 314856.199000000, C24 24066200.488 4 9 -1496.777 42.000
GOBS, 314856.199000000, C09 41038802.886 9 213699815.76337 -1391.943 30.000
GOBS, 314856.199000000, R10 20885796.375 8 111333055.23728 -1125.414 35.000
GOBS, 314856.199000000, R17 21027399.505 9 112521861.85837 1.771 31.000
GOBS, 314856.199000000, G16 24420695.497 9 9 -607.284 34.000
GOBS, 314856.199000000, E25 26416183.541 9 9 1623.139 22.000
GOBS, 314856.199000000, R09 23641111.957 9 9 -3901.952 26.000
GOBS, 314856.199000000, E24 27240945.515 8 9 -857.287 38.000
GOBS, 314856.199000000, E05 27154158.133 8 9 -2871.781 35.000
GOBS, 314856.399000000, G04 24066902.088 8 126472426.50726 -3656.825 35.000
GOBS, 314856.399000000, G09 21204516.880 8 9 -2576.887 25.000
GOBS, 314856.399000000, G06 21843791.401 9 9 -3361.335 14.000
GOBS, 314856.399000000, C24 24066258.112 4 125319321.10437 -1491.643 44.000
GOBS, 314856.399000000, C09 41038856.136 8 213700093.52228 -1387.629 30.000
GOBS, 314856.399000000, R10 20885839.907 8 111333279.85427 -1119.290 37.000

...

GOBS, 316465.400000000, G09 22053796.355 9 7 -2965.625 42.000 22053774.011 9
9 -2311.088 23.000
GOBS, 316465.400000000, G06 22958748.483 8 9 -3890.580 43.000 22958742.892 9
9 -3018.360 18.000
GOBS, 316465.400000000, G04 25190987.721 9 9 -3672.705 35.000
GOBS, 316465.400000000, G20 20618874.632 4 9 1326.448 48.000
GOBS, 316465.400000000, G07 20956968.745 8 9 -528.696 32.000
GOBS, 316465.400000000, C14 26537412.626 9 9 -3269.531 39.000
```

Column	ground truth position	Comments
1	ground truth position label	"POSI"
2	GPS Time of Week (ToW) in second	GPS Time of Week (ToW) in second
3	WGS84 longitude in decimal degrees	
4	WGS84 latitude in decimal	
5	Floor Number in integer	0 : Ground Floor, -1, 1, 2
6	key point number index	

Sample strings for ground truth position data

```
POSI,308945.294,-1.6313191524195993,47.22617430160391,-1,1
POSI,308960.836,-1.6310604539849840,47.22612380681056,-1,2
```

Note: POSI frame is only used twice in TrialDataSet. It is not used in evaluation sessions.

Inputs given to competitors

The materials and methods provided by the competition organizers are:

- **Datasheet of each individual sensors can be downloaded here:**
 - Xsens MTI-1 :
http://evaal.aaloo.org/images/2021/track4/MTi-7_Leaflet.pdf
 - Ublox ZED F9P GNSS Receiver:
[http://evaal.aaloo.org/images/2021/track4/ZED-F9P_ProductSummary_\(UBX-17005151\).pdf](http://evaal.aaloo.org/images/2021/track4/ZED-F9P_ProductSummary_(UBX-17005151).pdf)
http://evaal.aaloo.org/images/2021/track4/RINEX_3.04.IGS.RTCM_Final.pdf
- **LogFiles to download and to use before evaluation (for both session 1 and 2):**
 - 2021.09.02_ULISS_AllanVariance.zip : static logfile of more than 15 hours that can be used for sensors bias estimation
http://evaal.aaloo.org/images/2021/track4/2021.09_ULISS_AllanVariance.zip :
 - acceleration.csv
 - rotation.csv
 - magnetic.csv
 - pressure.csv
 - temperature.csv
 - 2021.09.15_ULISS_MagCalib.zip : logfile of about 1 minute that can be used to calibrate the magnetometer sensor
http://evaal.aaloo.org/images/2021/track4/2021.09.15_ULISS_MagCalib.zip
 - acceleration.csv
 - rotation.csv
 - magnetic.csv
- **GNSS Navigation files that contain ephemeris for those who want to use GNSS sensor :**
 - session1_gnss.nav: GNSS Navigation file for session1 (format RINEX 3.04)
http://evaal.aaloo.org/images/2021/track4/session1_gnss.nav
 - session2_gnss.nav: GNSS Navigation file for session2 (format RINEX 3.04)
http://evaal.aaloo.org/images/2021/track4/session2_gnss.nav

- **Coordinates of Key Point n°1 (same for both session 1 and 2):**
 - WGS84 longitude in decimal degrees: *-1.6313191524195993*
 - WGS84 latitude in decimal degrees: *47.22617430160391*
 - Floor Number in integer: *-1*

- **Coordinates of Key Point n°2 (same for both session 1 and 2):**
 - WGS84 longitude in decimal degrees: *-1.631060453984984*
 - WGS84 latitude in decimal degrees: *47.22612380681056*
 - Floor Number in integer: *-1*

- **Note about Maps use**
 - Even if maps may be allowed in others tracks, for this one, **it is NOT**. Track chairs, in such a case, could cancel contributions of competitor.
 - Algorithms are not supposed to embed or access maps to enhance positioning.

Session 1: dataset recorded around **15h45 (local time)**, the 15th of September

- **Timing of expected Key Points:**
 - 83 key points will be evaluated in Track4 : from 3 to 85
 - Key Points timestamps are expressed in GPS Time of Week in seconds (s), hereafter in the table.

Key Point	GPS Time of Week (s)	Key Point	GPS Time of Week (s)	Key Point	GPS Time of Week (s)
1*	308945.294	30	309778.168	59	310502.561
2*	308960.836	31	309881.752	60	310567.480
3	308976.111	32	309893.883	61	310580.113
4	308990.088	33	309906.198	62	310592.378
5	309002.014	34	309917.817	63	310601.509
6	309014.780	35	309972.535	64	310615.558
7	309022.926	36	309984.353	65	310628.286
8	309029.910	37	309993.111	66	310676.329
9	309039.174	38	310002.843	67	310688.873
10	309145.224	39	310024.502	68	310699.335
11	309186.323	40	310039.365	69	310783.689
12	309202.144	41	310054.263	70	310810.773
13	309207.260	42	310071.496	71	310823.555
14	309225.605	43	310087.427	72	310980.767
15	309250.396	44	310106.513	73	311008.253
16	309263.674	45	310173.810	74	311035.611
17	309279.550	46	310183.035	75	311052.397
18	309291.084	47	310205.504	76	311064.380
19	309305.375	48	310258.708	77	311094.500
20	309320.843	49	310293.343	78	311282.676
21	309330.410	50	310306.095	79	311361.069
22	309512.491	51	310324.789	80	311390.255
23	309527.796	52	310343.358	81	311412.163
24	309556.105	53	310353.269	82	311418.497
25	309568.216	54	310363.170	83	311428.756
26	309594.479	55	310372.852	84	311439.655
27	309677.148	56	310446.256	85	311460.997
28	309755.879	57	310476.495		
29	309768.646	58	310485.099		

*: coordinates given (see above)

The output format is described in the chapter “Description of the Output File” here after.

- **Header of GNSS “OBSERVATION DATA” file under Rinex 3.04 format**

```

3.04      OBSERVATION DATA      M: Mixed      RINEX VERSION / TYPE
RTKCONV demo5 b34c      20210930 154220 UTC PGM / RUN BY / DATE
format: u-blox UBX      COMMENT
log: D:\IPIN2021\DataCollection\2021.09.15_15h30_Acquil\ULISCOMMENT
MARKER NAME
MARKER NUMBER
MARKER TYPE
OBSERVER / AGENCY
REC # / TYPE / VERS
ANT # / TYPE
APPROX POSITION XYZ
4337853.3676 -123576.7925 4658733.9793 ANTENNA: DELTA H/E/N
0.0000 0.0000 0.0000
G 8 C1C L1C D1C S1C C2X L2X D2X S2X SYS / # / OBS TYPES
R 8 C1C L1C D1C S1C C2C L2C D2C S2C SYS / # / OBS TYPES
E 8 C1X L1X D1X S1X C7X L7X D7X S7X SYS / # / OBS TYPES
S 4 C1C L1C D1C S1C SYS / # / OBS TYPES
C 8 C2I L2I D2I S2I C7I L7I D7I S7I SYS / # / OBS TYPES
2021 09 15 13 48 01.2070000 GPS TIME OF FIRST OBS
2021 09 15 14 33 04.2070000 GPS TIME OF LAST OBS
G L1C SYS / PHASE SHIFT
G L2X -0.25000 SYS / PHASE SHIFT
R L1C SYS / PHASE SHIFT
R L2C SYS / PHASE SHIFT
E L1X 0.00000 SYS / PHASE SHIFT
E L7X 0.00000 SYS / PHASE SHIFT
S L1C SYS / PHASE SHIFT
C L2I SYS / PHASE SHIFT
C L7I SYS / PHASE SHIFT
12 R01 1 R02 -4 R07 5 R08 6 R09 -2 R10 -7 R11 0 R16 -1 GLONASS SLOT / FRQ #
R17 4 R22 -3 R23 3 R24 2 GLONASS SLOT / FRQ #
C1C 0.000 C1P 0.000 C2C 0.000 C2P 0.000 GLONASS COD/PHS/BIS
END OF HEADER

```


Session 2: dataset recorded around 17h15 (local time), the 15th of September

- **Timing of expected Key Points:**
 - 83 key points will be evaluated in Track4 : from 3 to 85
 - Key Points timestamps are expressed in GPS Time of Week in seconds (s), hereafter in the table.

Key Point	GPS Time of Week (s)	Key Point	GPS Time of Week (s)	Key Point	GPS Time of Week (s)
1*	314464.119	30	315298.217	59	316002.074
2*	314479.680	31	315405.177	60	316067.544
3	314494.550	32	315417.901	61	316079.626
4	314508.178	33	315430.545	62	316092.067
5	314519.029	34	315441.137	63	316100.796
6	314531.177	35	315498.639	64	316115.968
7	314539.394	36	315511.795	65	316131.648
8	314546.146	37	315523.122	66	316177.077
9	314554.692	38	315534.042	67	316189.403
10	314653.472	39	315556.677	68	316200.670
11	314690.208	40	315573.167	69	316284.229
12	314704.715	41	315588.007	70	316309.169
13	314709.778	42	315603.373	71	316319.587
14	314726.705	43	315617.840	72	316477.414
15	314751.531	44	315636.094	73	316506.845
16	314763.828	45	315683.853	74	316534.418
17	314779.473	46	315695.036	75	316550.102
18	314791.153	47	315718.421	76	316559.894
19	314805.333	48	315766.314	77	316587.909
20	314820.570	49	315799.477	78	316791.764
21	314830.328	50	315812.175	79	316885.342
22	315014.273	51	315830.200	80	316909.820
23	315029.267	52	315846.496	81	316926.458
24	315059.662	53	315855.041	82	316933.781
25	315071.840	54	315863.442	83	316944.035
26	315092.353	55	315872.961	84	316955.015
27	315196.607	56	315947.424	85	316976.482
28	315276.853	57	315974.505		
29	315288.742	58	315984.551		

*: coordinates given (see above)

The output format is described in the chapter “Description of the Output File” here after.

- **Header of GNSS “OBSERVATION DATA” file under Rinex 3.04 format**

```

3.04      OBSERVATION DATA      M: Mixed      RINEX VERSION / TYPE
RTKCONV demo5 b34c      20210930 154548 UTC PGM / RUN BY / DATE
format: u-blox UBX      COMMENT
log: D:\IPIN2021\DataCollection\2021.09.15_17h15_Acqui2\ULISCOMMENT
MARKER NAME
MARKER NUMBER
MARKER TYPE
OBSERVER / AGENCY
REC # / TYPE / VERS
ANT # / TYPE
APPROX POSITION XYZ
4337849.4702 -123594.0862 4658735.5346
0.0000      0.0000      0.0000
ANTENNA: DELTA H/E/N
G 8 C1C L1C D1C S1C C2X L2X D2X S2X      SYS / # / OBS TYPES
R 8 C1C L1C D1C S1C C2C L2C D2C S2C      SYS / # / OBS TYPES
E 8 C1X L1X D1X S1X C7X L7X D7X S7X      SYS / # / OBS TYPES
S 4 C1C L1C D1C S1C      SYS / # / OBS TYPES
C 7 C2I L2I D2I S2I C7I D7I S7I      SYS / # / OBS TYPES
2021 09 15 15 20 09.1990000      GPS      TIME OF FIRST OBS
2021 09 15 16 03 42.4000000      GPS      TIME OF LAST OBS
G L1C      SYS / PHASE SHIFT
G L2X -0.25000      SYS / PHASE SHIFT
R L1C      SYS / PHASE SHIFT
R L2C      SYS / PHASE SHIFT
E L1X 0.00000      SYS / PHASE SHIFT
E L7X 0.00000      SYS / PHASE SHIFT
S L1C      SYS / PHASE SHIFT
C L2I      SYS / PHASE SHIFT
11 R01 1 R02 -4 R08 6 R09 -2 R10 -7 R11 0 R12 -1 R17 4 GLONASS SLOT / FRQ #
R18 -3 R23 3 R24 2      GLONASS SLOT / FRQ #
C1C 0.000 C1P 0.000 C2C 0.000 C2P 0.000      GLONASS COD/PHS/BIS
END OF HEADER

```

Description of the Output stream to return by competitor

For each trial, competitor is asked to give processed data with the following format:

- 5 fields :
 - Field 1: Timestamp in **seconds**
 - Field 2: WGS84 longitude in decimal degrees with at least 9 decimal digit resolution
 - Field 3: WGS84 latitude in decimal degrees with at least 9 decimal digit resolution
 - Field 4: Floor Number in integer (0 : Ground Floor, -1, 1, 2)
 - Field 5: index in integer (key point number from 1 to N. 0 represents no key point. Each specific integer represents the specific key point)
- Comma (",") used as data delimiter

Example :

```
314479.680,141.346908569,43.070758819,-1,0
314531.177,141.346893310,43.070755004,-1,0
314704.715,141.346893310,43.070755002,-1,0
314805.333,141.346893308,43.070755003,-1,0
315014.273,141.346893310,43.070755004,-1,1
315071.840,141.346908569,43.070758819,0,0
315276.853,141.346908570,43.070758817,0,0
315405.177,141.346908579,43.070758819,0,0
315534.042,141.346908569,43.070758815,1,2
315573.167,141.346908565,43.070758819,1,0
315695.036,141.347000132,43.070770263,1,0
315830.200,141.347000142,43.070770261,2,0
315947.424,141.347000152,43.070770262,2,3
316100.796,141.347000162,43.070770263,2,0
```

Estimated position for
key point 1

Estimated position for
key point 2

Estimated position for
key point 3

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).

In others words : column 1 will not be assessed, and thus can be slightly different from the expected time.

What is important is to put correctly the right key point id in field n°5.

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:

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

$$\text{SampleError}(R_i, E_i) = \text{Distance}(R_i, E_i) + (\text{penalty} \times \text{floorfail})$$

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.

- $\text{Distance}(R_i, E_i)$ calculates the Euclidean distance between coordinates (longitude and latitude) of R_i and E_i .

The team with the lower “Accuracy Score” wins.

Contact points and information

For any further question about the database and this competition track, please contact to:

- Miguel Ortiz (miguel.ortiz@univ-eiffel.fr) at the University Gustave Eiffel, France.
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Introduced changes

For any further question about the database and this competition track, please contact to:

Version 1.0	September 3 rd	Initial Submission
Version 2.0	September 30 th	Change from PERSY sensor to ULISS sensor. New data, and its format are described. Clarification on the two different sessions that will be proposed to competitors.
Version 2.1	October 14 th	Simplification of data format: GPS Time of Week (ToW) is given as a whole, not as seconds + nanoseconds part. Unit of GPS ToW is second everywhere (instead of a mix of ms and s) POSI label description has been added (for TrialDataSet) A TrialDataSet is proposed to competitors in order to be prepared for the evaluation. This TrialDataSet is based on session1, stops after KeyPoint#2, and is fully accessible or reloadable. The GroundTruth position of KeyPoint#1 & #2 have been added in the TrialDataSet under the POSI label.