IPIN Competition 2020
Track 3 Smartphone-based (off-line)

2020.12.14

Joaquín Torres-Sospedra (UBIKGS/UJI) – Antonio R. Jiménez (CSIC)

IPIN 2020
ELEVENTH INTERNATIONAL CONFERENCE ON
INDOOR POSITIONING
AND INDOOR NAVIGATION
December 14, 2020, ONLINE

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Track 3: Smartphone-based

The **competing system** should be engineered in a form of localization system that **exploits available smartphone sensors**.

We strongly welcome:

- ✓ **Fingerprinting** approaches using Wi-Fi RSS values, BLE RSS values, or Magnetic patterns.
- ✓ **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.
- ✓ **Any other innovative approach**. The use of **map information**, or **activity recognition** (detecting states like going upstairs, in a lift, etc.) are acceptable.

Track 3: Smartphone-based

IPIN 2015 – Banff **Only Wi-Fi fingerprinting**

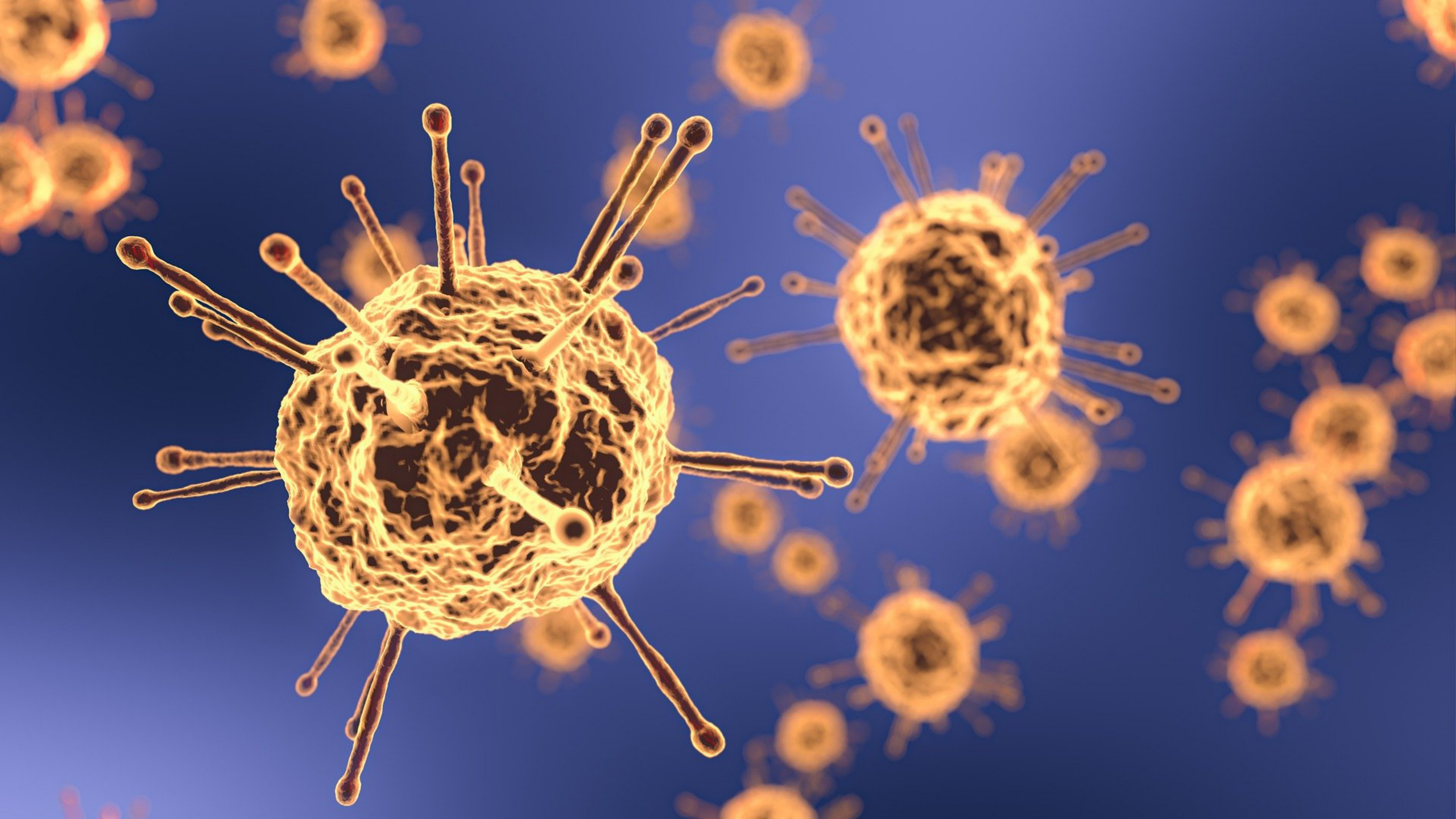
IPIN 2016 – Alcalá **Multi-sensor data was introduced**

IPIN 2017 – Sapporo **Multi-device collection was extended**

IPIN 2018 – Nantes **Data Collection in a Shopping area**

IPIN 2019 – Banff **Data Collection in a Research center**

IPIN 2020 – Beijing **Data Collection in a real challenging area…**



Track 3: Smartphone-based

PLAN A: Data collection in Beijing (April 2020)

Thanks Dongyan, Wenchao & IPIN2020 Team!

PLAN B: Data collection in Atlantis (with Track 4)

Thanks Miguel & GEOLOC!

PLAN C: Local Data collection in UJI's Library

Track 3: Smartphone-based

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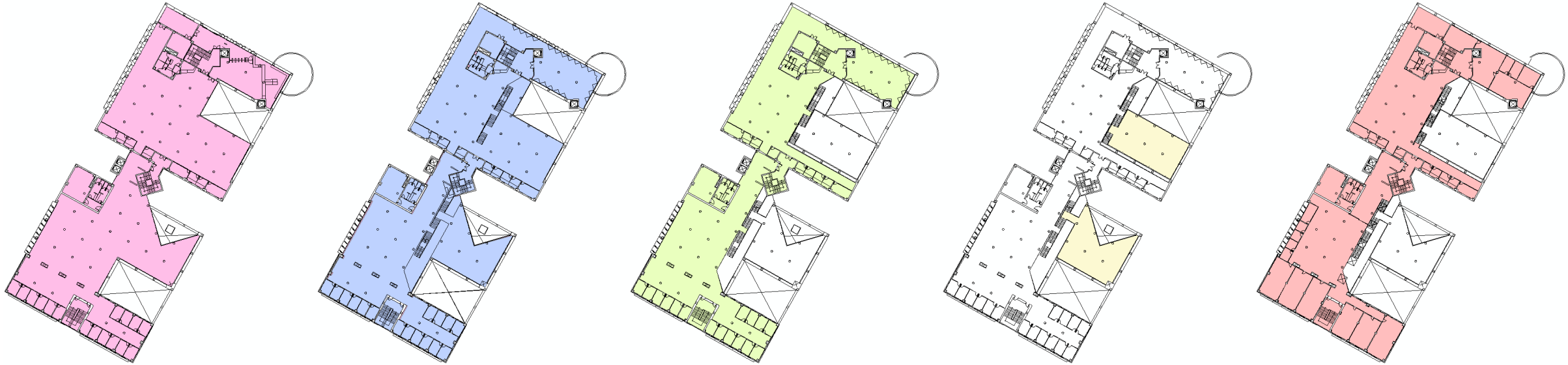

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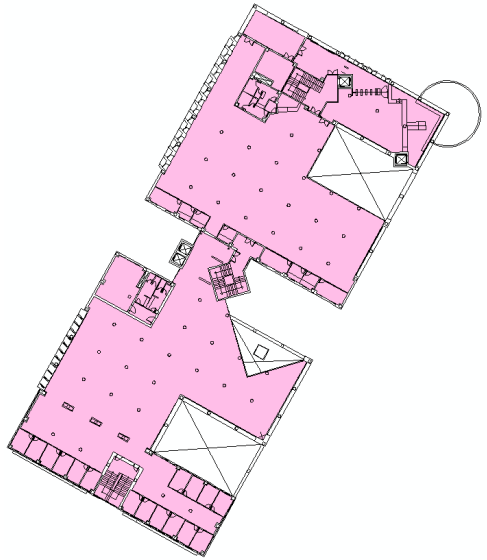

5 floors – from level 1 to level 5

Indoor floor plans in geo-referenced Autocad (.dxf)

150 reference locations for calibration with ArcMap

82 independent reference locations for evaluation

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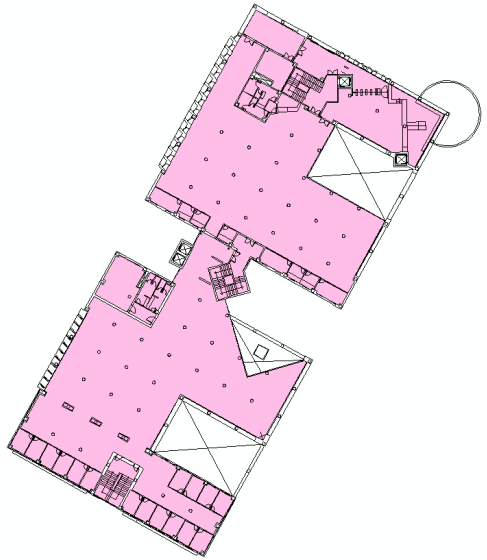

78 training logfiles (17 + 4 + 2 routes) – 275 minutes

13 validation logiles – 50 minutes

1 evaluation logfile – 20 minutes

Almost 6 hours of raw data

Data collection spanned from July 1st to 7th

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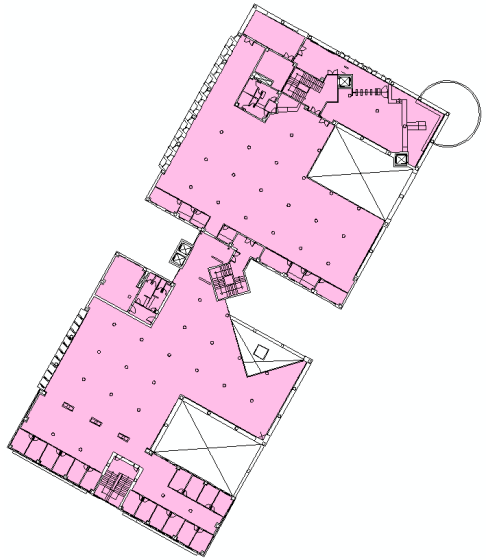

ZENODO:

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

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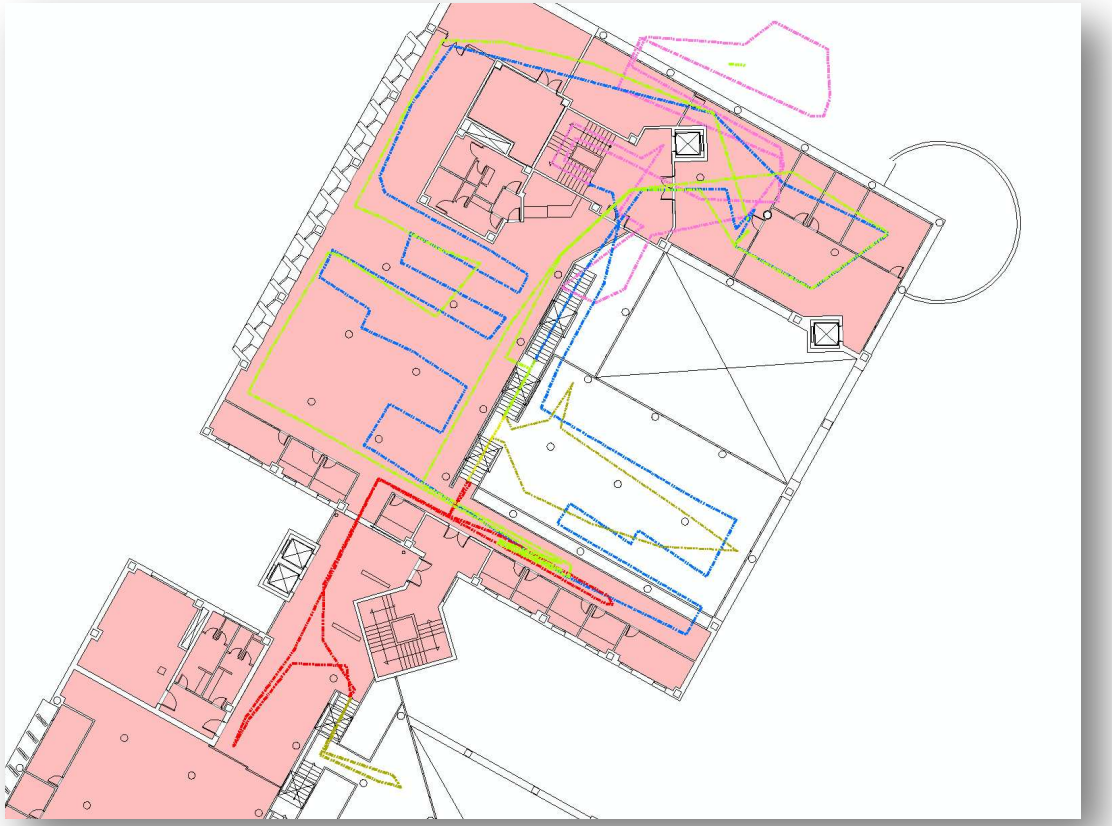

Challenges:

- 82 evaluation points – 20 minutes
- Phone call simulation
- Outdoor path
- Visiting an unknown area
- Interacting with the screen
- Whatsapp simulation
- Planned BLE data, but…

Track 3: Smartphone-based

11 TEAMS:

- imec-Waves
- Indora
- IOT2US
- NLE - MAD PDR
- Next-Newbie Reckoners
- TJU
- UMinho
- WHU-Five
- WiMap
- XMU ATR
- YAI

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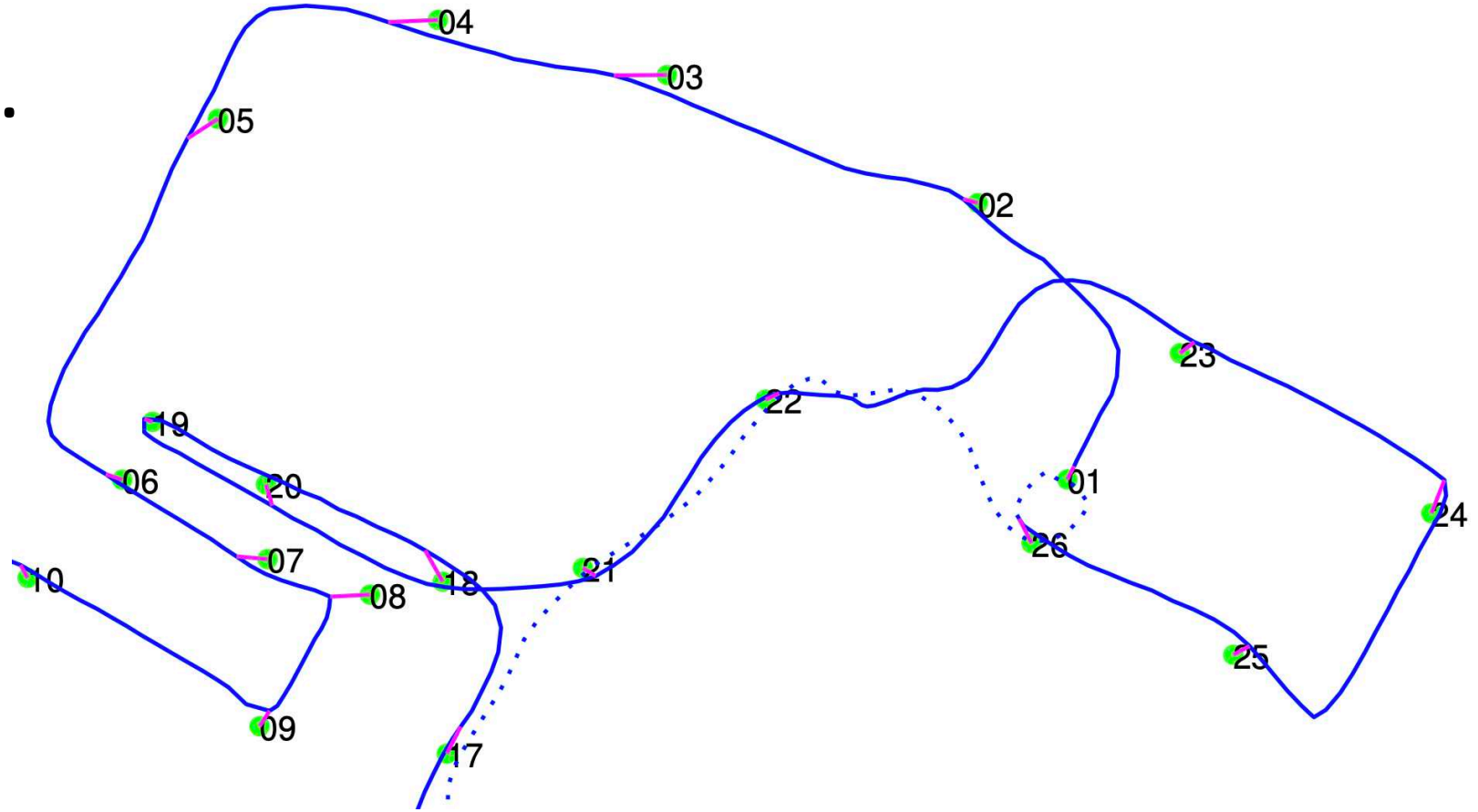
Winner's results….



Track 3: Smartphone-based

Results (third quartile):

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- Indora
- IOT2US
- NLE - MAD PDR
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#	Team	Score
1		
2		
3		
4		
5		
6		

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#	Team	Score
1		0.98
2		1.72
3		1.85
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5		2.72
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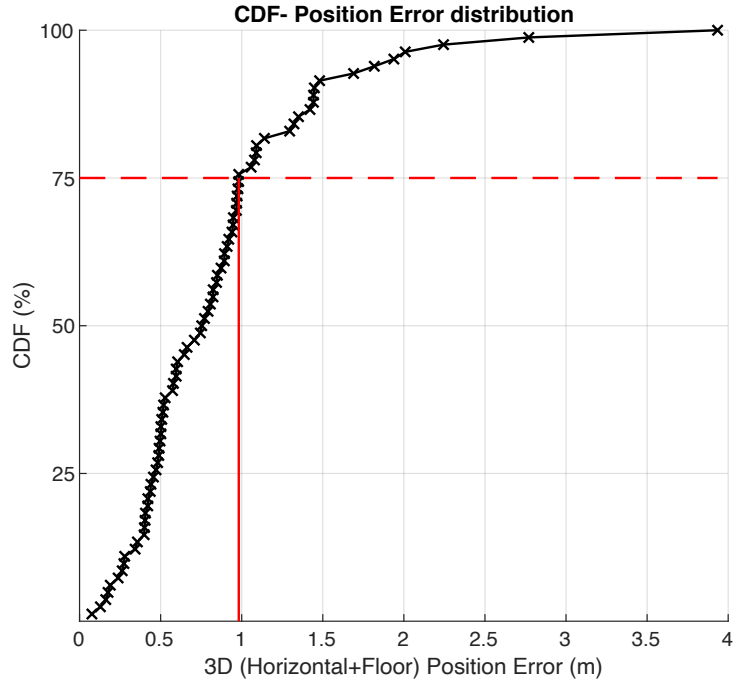
WINNER performance details:

Error statistics:

- Correct Floor detection: 100.00 %
- Median: 0.76 m
- Mean: 0.86 m
- RMS: 1.05 m
- 90th perc.: 1.46 m
- 75th perc.: 0.98 m



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WINNER

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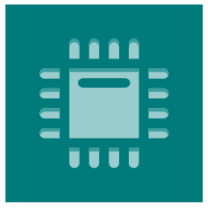
WHU-FIVE



sensors
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Thank you for all!

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frontiers

sensors

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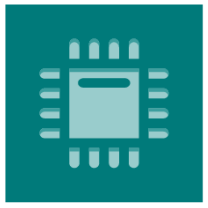

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