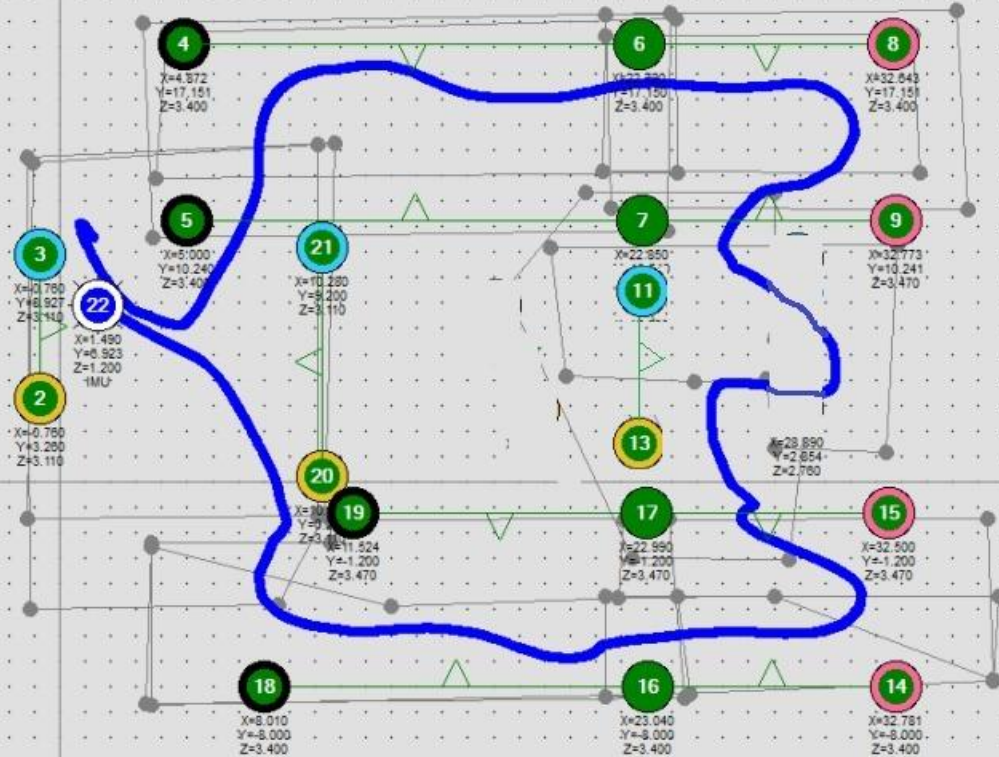


- T=200
- HT off
- S2 on
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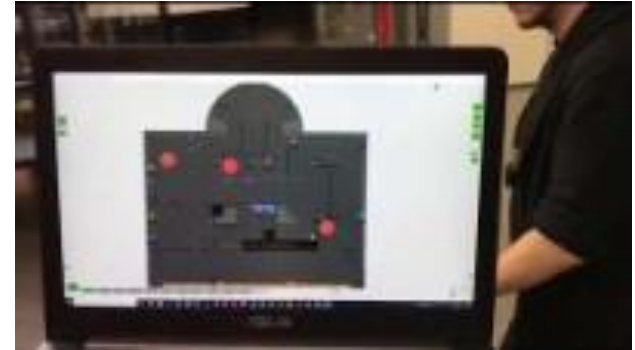
freeze zones

Precise ($\pm 2\text{cm}$) people tracking indoor

For exhibitions, museums, offices

Task

- Get precise real-time tracking indoor in exhibitions, museums, offices
- Accuracy
 - Usually - <50cm (Marvelmind and UWB would qualify)
 - Possible – up to ± 2 cm (Marvelmind only)
- Low latency: virtual assistant on the wall following a real person
- We can't share photos, videos or other specific details due to an NDA



https://youtu.be/bZKJ_EQQHCU

Problems

- Sufficiently high accuracy
 - Marvelmind Indoor “GPS”
 - UWB – good enough
 - Optical
- Obstructions by people/visitors
- Obstruction by multiple exhibiting elements in the air
- Very loud music
- Flashy show lights

Solution



- Indoor “GPS” based solution:
Location of a mobile beacon - Mini-RX with external microphone on tablet or a Badge on person - is calculated based on the propagation delay of ultrasonic signal from a set of stationary ultrasonic beacons installed using **trilateration**

Implementation details

Marvelmind Dashboard for system setup and monitoring

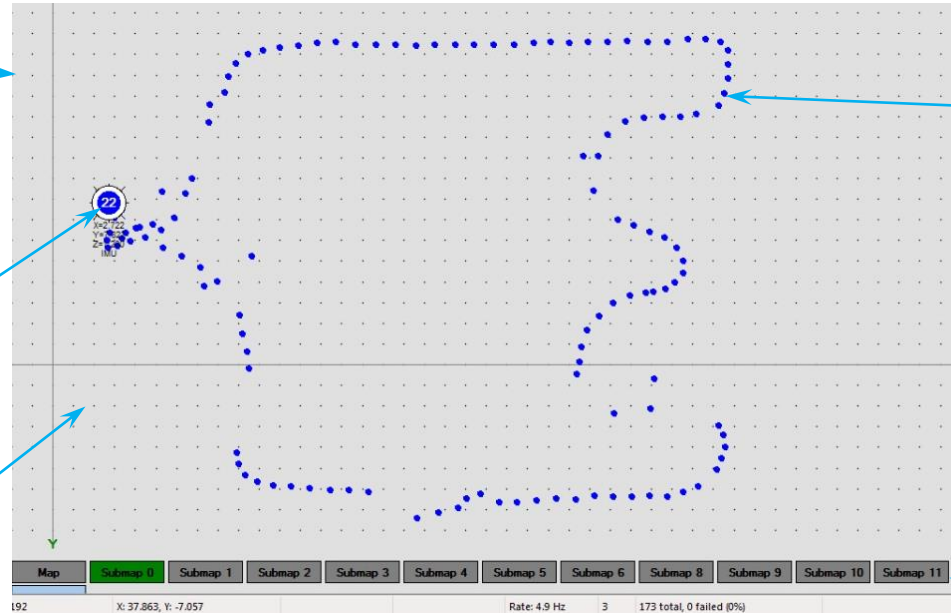
Mobile beacon

Stationary beacons placed every 10-20m on walls.

Different colors for different ultrasonic frequencies.

Inverse Architecture (IA)

Path of a person in real time with 3.5Гц update rate and Realtime Player disabled



Fully overlapping submaps in TDMA configuration

Area:

- ~35x35m
- Many walls and suspended by wires in the air exhibits

Implementation details

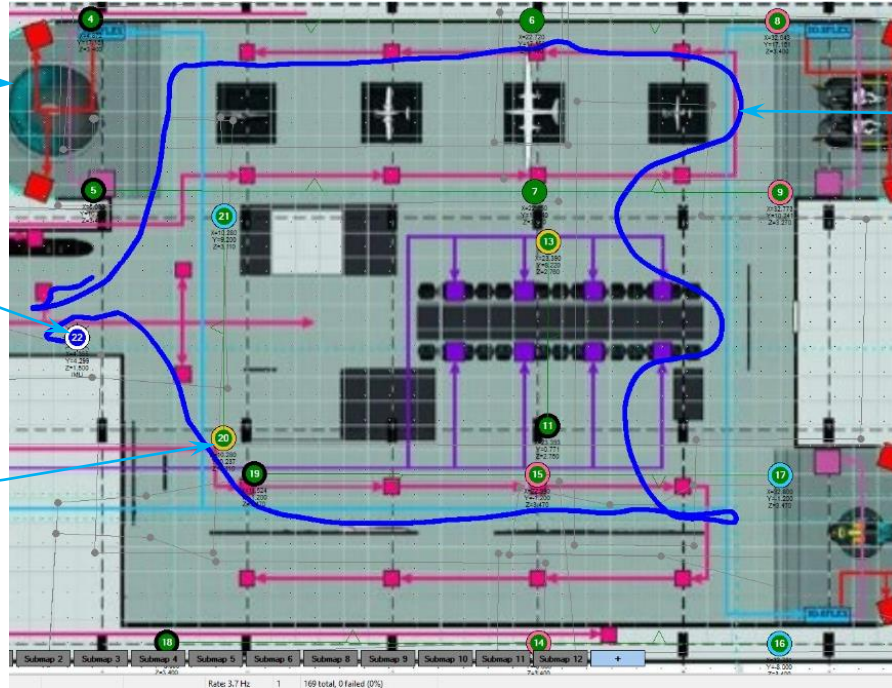
Marvelmind Dashboard with a floorplan for system setup and monitoring

Mobile beacon

Stationary beacons placed every 10-20m on walls.

Different colors for different ultrasonic frequencies.

Inverse Architecture (IA)



Path of a person in real time with 3.5-4.5Hz update rate and Realtime Player enabled

Area:

- ~35x35m
- Many walls and suspended by wires in the air exhibits

Implementation details

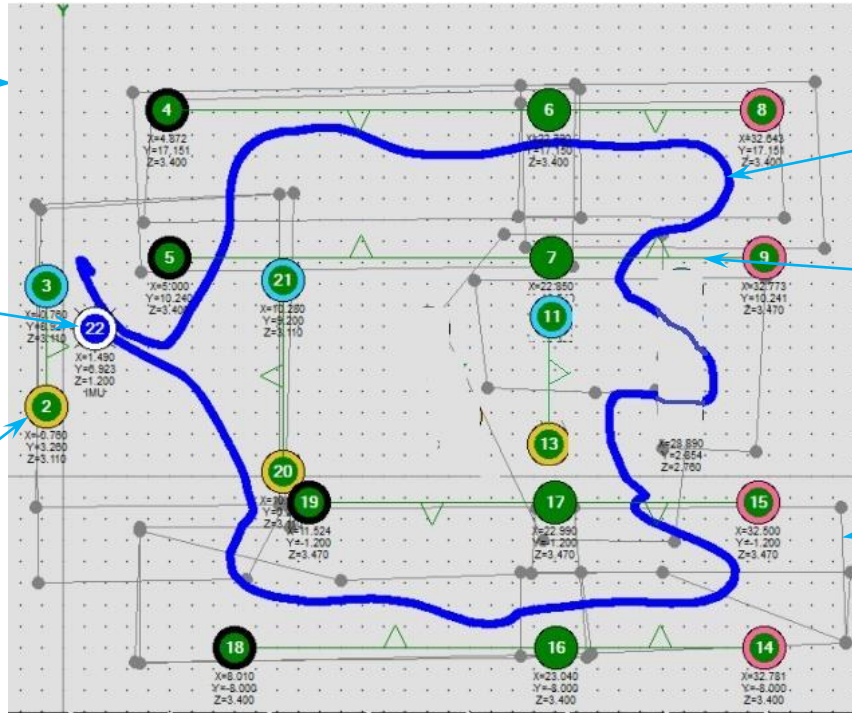
Marvelmind Dashboard for system setup and monitoring

Mobile beacon

Stationary beacons placed every 10-20m on walls.

Different colors for different ultrasonic frequencies.

Inverse Architecture (IA)



Path of a person in real time with 3.5Γ update rate and Realtime Player enabled

Fully overlapping submaps in TDMA configuration

Service zone

Area:

- ~35x35m
- Many walls and suspended by wires in the air exhibits

Thank you!

Marvelmind Robotics

Marvelmind OÜ

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