

# TECHNOLOGY OFFER

## Multipath-assisted Indoor Navigation and Tracking (MINT)

A novel radio-based localization and tracking concept has been developed that treats multipath propagation as source of additional information and not as error source. This information makes localization robust in situations where conventional systems fail. Furthermore, the exploitation of multipath propagation helps to significantly reduce the required infrastructure.

### BACKGROUND

Indoor scenarios, especially industrial ones, are harsh environments: Due to enclosing walls, furniture, machines, moving persons, etc., the direct signal path between anchors and mobile devices can easily be blocked; the number and density of the multipath components caused by reflections and scattering is large. While this causes major problems for existing localization systems, MINT can actively exploit the relevant information in these so-called multipath radio signals.

### TECHNOLOGY

Future and emerging indoor localization systems will rely on multiple different sensor systems to estimate the position of a device, such as accelerometers and radios available on smartphones. MINT uses a maximum of position-related information embedded in a radio signal. Not only the direct signal path between an anchor (the infrastructure) and the mobile, but also deterministic reflections caused by building elements can be exploited. As a consequence, less infrastructure is needed: A single base station can already allow for centimeter-level localization. The uncertainty of the information contained in the reflected signals is learned automatically, which is needed for optimally processing the available information.

With our real-time demonstration system of MINT, we consistently achieve accuracies better than 5cm, i.e. robust and accurate indoor localization is provided.

### ADVANTAGES

The potential fields of application include intelligent and flexible production, logistics, tracking of rescue forces, ambient assisted living and navigation for autonomous systems and vehicles. The advantages include:

- Potential to reduce infrastructure by effective use of information
- Robust achievement of centimeter-level accuracy
- Self-adaptation of the system to the environment during localization
- Provide positioning where conventional systems fail

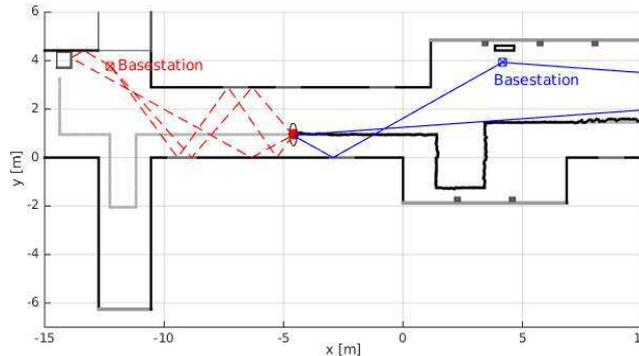


Figure 1: MINT working with reflections from only two basestations - where conventional systems fail

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### KEYWORDS:

Robust and accurate  
(Indoor) Localization  
(Ultra-)wideband Radio  
Low Infrastructure

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### COOPERATION OPTIONS:

Licensing  
Technical co-operation  
Consulting

### DEVELOPMENT STATUS:

Laboratory Demonstrator  
Prototype Development

### STATUS OF PATENTS:

EU and International Patent  
filed

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