# Landmark Graph-Based Indoor Localization$_1$

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1 Introduction

2 Bibliography

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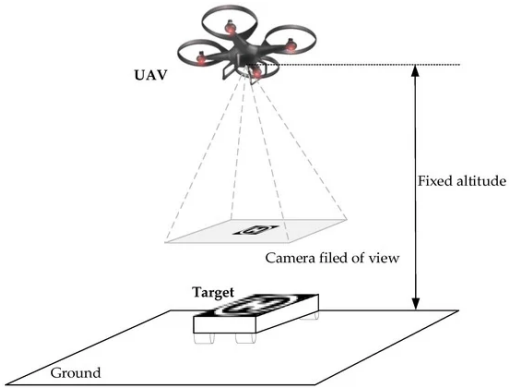


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Figure 1: Some examples of application

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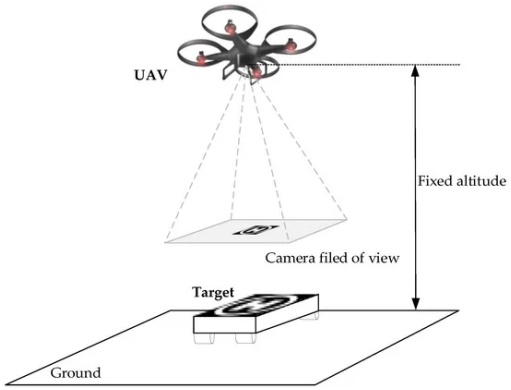


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- It's **difficult to use** for inside location: **signal** is *blocked* by buildings, trees, obstacles, ...

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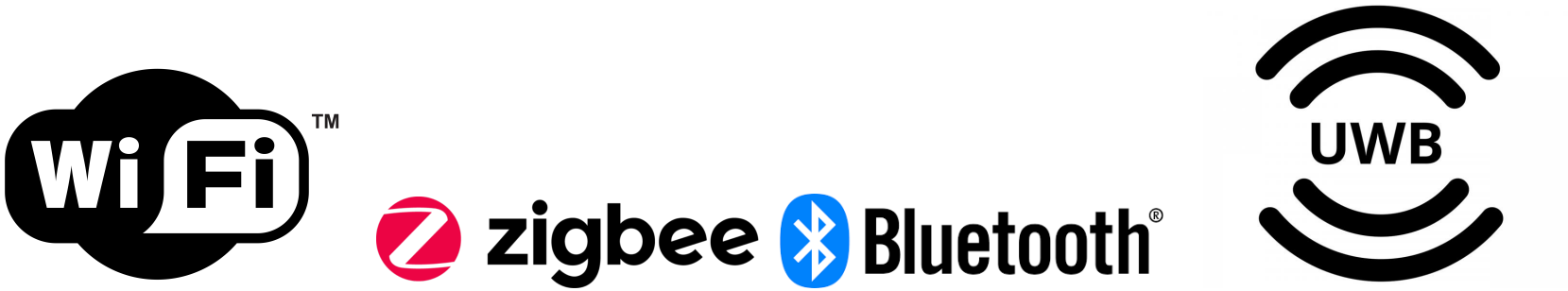


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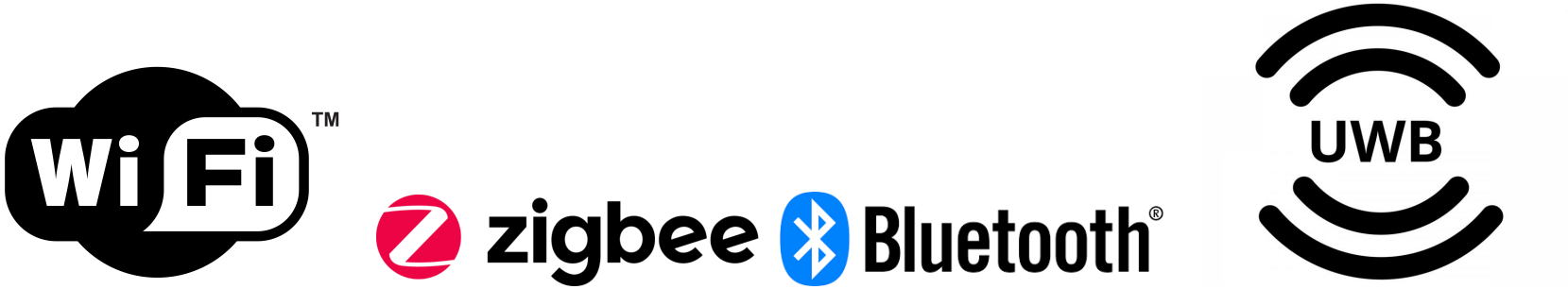


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- Each technique has **drawbacks** in terms of accuracy, cost coverage, complexity and applicability.

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In the context of indoor localization, a landmark is

## Definition of **landmark** for indoor localization

A location point where at least one sensor presents a distinctive, stable and identifiable pattern in the reading. Points are typically naturally distributed in indoor environments.

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- A mismatch of landmarks causes large localization errors (= failure of localization).

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## Landmark graph

It's a directed graph where nodes are landmarks and edges are accessible paths with heading information

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The initial location is inferred bya Hidden Markov model-based method and the location is regularly calibrated by matching the detected landmark with those in the landmark graph.

# Challenges

1. Infer the initial location without manual input;
2. Recognize landmarks satisfying;
3. Deal with a landmark association issue and missing landmarks.

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[1] F. Gu, S. Valaee, K. Khoshelham, J. Shang, and R. Zhang, "Landmark graph-based indoor localization," *IEEE Internet of Things Journal*, vol. 7, no. 9, pp. 8343–8355, 2020. DOI: 10.1109/JIOT.2020.2989501.

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*Thanks for the attention!*