

# Manage the Data from Indoor Spaces: Models, Indexes & Query Processing

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April 21, 2016

# Overview

1. Outlines
2. Indoor Space Models & Applications
3. Indoor Data Cleansing
4. Indoor Movement Analysis
5. Appendix

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## About This Work...

*Distance-Aware Join for Indoor Moving Objects.* [1]

X. Xie, H. Lu, and T. B. Pedersen.

- Published at *TKDE' 2015*.
- Study efficient evaluation of distance-aware join operations on indoor moving objects, semi-range join and semi-neighborhood join.
- Design a composite index for indoor space as well as objects.

# Motivation

- People spend a large part of their lives in indoor spaces.
- the New Town Plaza in Hong Kong covers 200,000 square meters and consists of 34 interconnected buildings. The weekend traffic is as high as 320,000 people as reported in 2004.
- A large Danish hospital logistic system, requires tracking up to 164,000 objects, including around 10,000 persons, 10,000 pieces of equipment, 70,000 aids and 70,000 materials over 10 floors.

## 2.7 Distance-Aware Join for Indoor Moving Objects

# Distance-Aware Joins

### Example (Indoor distance-based monitoring)

In a shopping plaza, a covey of mobile security guards are patrolling and monitoring the surrounding people for the suspicious, which may appear within a range. The range can be specified by a distance threshold  $\epsilon$ .

### Example (Indoor facility tracking)

In a large hospital logistic system, it is time-critical to monitor patients in special care or nurses on the ward with their nearest medical facilities, such as a medical staff. The number of nearby facilities can be specified by a parameter  $k$ .

### Example (Indoor data analysis)

Many algorithms related to similarity search and data mining can be constructed on top of a join query. For indoor spatial databases, the join operator is an important primitive that allows efficient distance-aware analysis.

# References I

- [1] X. Xie, H. Lu, and T. B. Pedersen.  
Distance-aware join for indoor moving objects.  
In *TKDE*, pp. 428–442, 2015.



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The End. Thanks :)