Survey of Indoor Positioning Techniques

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Abstract—The abstract goes here.

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1 Introduction

This demo file is intended to serve as a "starter file" for IEEE Computer Society journal papers produced under LaTeX using IEEEtran.cls version 1.7 and later. I wish you the best of success.

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2 Graph Based Indoor Tracking

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3.1 log (working title)

When a reader detects a moving object it records a log. A reading is of the following format $<readerID, objectID, timestamp>$. The *readerID* is the identity of the reader, *objectID* is the identity of the object which is in the range of the reader, and the *timestamp* t is the time where the reader detected the object. This recording is done at a given sampling rate. The same object might be recorded several times by the same reader in a row. A reader creates a log for each object that is in the vicinity of the reader thus there can be several logs with the same *timestamp*.

From this log data two different outputs are created. All data from the readers are continuously streamed to a database that is responsible for maintaining the data. If a object enters the range of a reader an output is generated, this have the form

$$\textbf{On-line output:} <readerID, objectID, t, flag> \tag{1}$$

where *flag* is "'START"'. When the object is no longer detected by the reader an output is generated. It contains the last *t* where the object was within the vecinity and the *flag* set to "'END"'. A second output is generated based on the first output. It have the format

$$<readerID, objectID, t_{first}, t_{last}> \tag{2}$$

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5 Wi-Fi Based Indoor Tracking

Wi-Fi is a widespread technology and is deployed at most offices, homes,and pulic buildings. It is often used in indoor positioning systems [4], [5], [1], [3], [2]. A technique which employs Wi-Fi is the fingerprinting technique []. The technique is divided into two phases. An initial phases, called the offline phase, in which a *radio map* is created. The radio map is

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created by measuring the strengths of nearby Wi-Fi spots.

To use Wi-Fi for indoor positioning we use a so-called fingerprinting technology [2]

6 Discussion

what happens if a reader fails pros and cons for each method point our that they can be combined

Appendix two text goes here.

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References

[1] P. Bahl and V.N. Padmanabhan, *Radar: an in-building rf-based user location and tracking system*, INFOCOM 2000. Nineteenth Annual Joint Conference of the IEEE Computer and Communications Societies. Proceedings. IEEE, vol. 2, 2000, pp. 775–784 vol.2.

[2] A. Baniukevic, D. Sabonis, Christian S. Jensen, and Hua Lu, *Improving wi-fi based indoor positioning using bluetooth add-ons*, Mobile Data Management (MDM), 2011 12th IEEE International Conference on, vol. 1, 2011, pp. 246–255.

[3] Scott Bell, Wook Rak Jung, and Vishwa Krishnakumar, *Wifi-based enhanced positioning systems: accuracy through mapping, calibration, and classification*, Proceedings of the 2nd ACM SIGSPATIAL International Workshop on Indoor Spatial Awareness (New York, NY, USA), ISA '10, ACM, 2010, pp. 3–9.

[4] Ren Hansen and Bent Thomsen, *Efficient and accurate wlan positioning with weighted graphs*, Mobile Lightweight Wireless Systems (Fabrizio Granelli, Charalabos Skianis, Periklis Chatzimisios, Yang Xiao, and Simone Redana, eds.), Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, vol. 13, Springer Berlin Heidelberg, 2009, pp. 372–386.

[5] Z. Xiang, S. Song, J. Chen, H. Wang, J. Huang, and X. Gao, *A wireless lan-based indoor positioning technology*, IBM Journal of Research and Development **48** (2004), no. 5.6, 617–626.

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Jane Doe Biography text here.

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