

UW CENTER FOR PATTERN ANALYSIS AND MACHINE INTELLIGENCE

GRADUATE SEMINAR SERIES

Compressive Sensing Indoor Localization via Inconsistent Measurements

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Date: October 19, 2011

Time: 5 pm – 5:30 pm

Place: E5 (5128) Refreshments will be served

Abstract :

Location based services in wireless sensor networks are quite demanding applications especially in indoors, such that accurate localization of objects and people in indoor environments has long been considered as one of important building blocks in wireless systems. In this work, we investigate sensor location estimation problem where a target sensor measures inconsistent signals as received-signal-strength or time-of-arrival from anchor sensors with known locations, whereas target sensor location must be estimated. We know that even in large scale wireless sensor networks, information are relatively sparse compared with the number of sensors. In such networks, the localization problem can be recast as a sparse signal recovery problem in the discrete spatial domain from a small number of linear measurements by solving an under-determined linear system. By exploiting the compressive sensing theory, sparse signals can be recovered from far fewer samples than Nyquist sampling rate. Our approach uses a few number of inconsistent measurements to find the wireless device location over a non-symmetric spatial grid. In this method, an L1-norm minimization program is used to recover the wireless user location. The performance of the proposed method is evaluated through simulations with synthetic and real measurements.

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