Improving indoor localization via channel impulse response with statistically inferred context

Mots clés :
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Résumé du projet de recherche (Langue 1)
Research on localization techniques in indoor environments, where GPS is not viable, continues to be an active area. A popular approach is to piggyback localization on existing ubiquitous terrestrial radio networks such as WiFi, Bluetooth and cellular communications networks. Most approaches are base upon location-dependent variations in received signal strength, or RSSI, which, because of the Rayleigh nature of electromagnetic waves in cluttered environment, is notoriously unstable. Recently, some researchers have turned to correlating location with channel impulse response, CIR, which theoretically contains detailed information about the propagation environment. CIR measurements are available in many current telecommunications systems for the purpose of channel equalization, and may also be extracted for localization applications. To date such studies, though promising, have remained somewhat rudimentary. The thesis project proposes to develop data-driven approaches to learning CIR context for mobile targets in both time and space dimensions, in order to develop a prototype of a practical indoor localization system viable for consumer applications – including both hardware and software components – by leveraging readily available ubiquitous communications channel information.