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Averaged kernel floor localization algorithm for multi-floor wlan positioning

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Abstract. Multi-floor positioning is important especially to locate a user correctly in an urban area where multi-level buildings are located. In two-stage (vertical and horizontal) positioning, floor level is first determined prior to horizontal localization. Correct floor determination is crucial to ensure proper database selection for horizontal localization. This paper proposes a floor localization algorithm, the averaged kernel floor, which applies clustering technique and kernel density function to estimate the floor location of the user. The results show that the floor level could be determined accurately up to 91.7% in the tested environment. Additionally, the proposed algorithm has very low processing time of about 29 times lower compared to previous floor localization algorithms.

Keywords: Indoor Positioning; Localization; WLAN