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(54) **LOCATION ESTIMATION SYSTEM, METHOD AND PROGRAM**

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(57)   **ABSTRACT**

A location estimation method using label propagation. The achieved location estimation method is robust to variations in radio signal strengths and is highly accurate by using the q-norm ($0<q<1$), especially, for calculating the similarities among radio signal strength vectors. The accuracy in location estimation is further improved by putting more importance on the time-series similarities. Specifically, the time-series similarity is calculated by using time-series values indicating the temporal order of radio signal strengths during the measurement. If the time-series similarity is larger than the similarity between the radio signal strength vectors, the time-series similarity is preferentially used. The exponential attenuation function can also be used for calculating the similarities, instead of the q norm ($0<q<1$).

27 Claims, 6 Drawing Sheets