World Academy of Science, Engineering and Technology
International Journal of Electronics and Communication Engineering
Vol:9, No:01, 2015

An Indoor Positioning System in Wireless Sensor Networks with Measurement Delay

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Abstract : In the current paper, an indoor positioning system is proposed with consideration of measurement delay. Firstly, an estimation filter with a measurement delay is designed for the indoor positioning mechanism under a weighted least square criterion, which utilizes only finite measurements on the most recent window. The proposed estimation filtering based scheme gives the filtered estimates for position, velocity and acceleration of moving target in real-time, while removing undesired noisy effects and preserving desired moving positions. Secondly, the proposed scheme is shown to have good inherent properties such as unbiasedness, efficiency, time-invariance, deadbeat, and robustness due to the finite memory structure. Finally, computer simulations shows that the performance of the proposed estimation filtering based scheme can outperform to the existing infinite memory filtering based mechanism.

Keywords : indoor positioning system, wireless sensor networks, measurement delay
Conference Title : ICIEV 2015 : International Conference on Informatics, Electronics and Vision
Conference Location : Singapore, Singapore
Conference Dates : January 08-09, 2015