عنوان مقاله:

A Wavelet-Based Neuro-Fuzzy System for DGPS Corrections Approximation

محل انتشار:

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خلاصه مقاله:

When Global Positioning System (GPS) measurements are made by two users within the same GPS satellite transmission sight, the associated errors are mainly similar. Consequently, knowing the exact location of the receiver with respect to GPS satellites within view allows the measurements errors to be estimated. Thus, these error estimates may be extracted by other nearby GPS users if relayed properly. This correction scheme is the idea behind Differential GPS (DGPS). Inspired by the theory of Multiresolution Analysis (MRA) of wavelet transforms and fuzzy concepts, a Fuzzy Wavelet Network (FWN) is proposed for approximating DGPS corrections. The FWN combines the traditional Takagi-Sugeno-Kang (TSK) fuzzy model and the Wavelet Neural Network (WNN). Each fuzzy rule corresponding to a WNN consists of single-scaling wavelets. The non-orthogonal and compactly supported functions as WNN bases are adopted. The online structure/parameter learning algorithm is performed concurrently in the FWN. The tests results on the collected real data are given to illustrate the performance and effectiveness of the proposed model. The results emphasize that RMS error reduces to less than 0.7m. Also, it is shown that performance FWN is .better than single WNN

کلمات کلیدی:

Fuzzy Wavelet Network, Wavelet Neural Network, DGPS, Corrections, Approximation