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ENHANCEMENT OF DATA IN BIOMEDICAL WIRELESS SENSOR NETWORKS

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Noise (from different sources), data dimension, and fading can have dramatic effects on the performance of biomedical wireless sensor networks and the decisions made at the fusion center. Any of these parameters alone or their combined result can affect the final outcome of a wireless sensor network. Total elimination of these parameters could be damaging to the final outcome, as it may result in removing useful information that can benefit the decision making process. Several attempts have been made to find the optimal balance of parameters, their location, and how to remove them. Experts in the field agree that it is more beneficial to remove noise and/or compress data at the node level. We have developed computationally low power, low bandwidth, and low cost filters that will remove the noise and compress the data so that a decision can be made at the node level. This wavelet-based method is guaranteed to converge to a stationary point for both uncorrelated and correlated sensor data. This is mainly stressed so that the low power, low bandwidth, and low computational overhead of the biomedical wireless sensor network node constraints are met while fused datasets can still be used to make reliable decisions.

Biography

Ehsan Sheybani earned BS, MS, and PhD in Electrical Engineering from UF, FSU, and USF respectively. His main research area has been applications of communication, signal processing, and data analysis. He has been involved in teaching, practicing, researching, and consulting applications of DSP in technology, system analysis, and data sciences for the past 20 years. He has a long list of publications and research grants including projects with NASA, NSF, NIH, DoD, DEd, and industry partners. Currently he serves as a faculty at the University of South Florida.

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