

A New Soft-Fusion Approach for Multiple-Receiver Wireless Communication Systems

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In this paper, a new soft-fusion approach for multiple-receiver wireless communication systems is proposed. In the proposed approach, each individual receiver provides the central receiver with a confidence level rather than a binary decision. The confidence levels associated with the local receiver are modeled by means of soft-membership functions. The proposed approach can be applied to wireless digital communication systems, such as amplitude shift keying, frequency shift keying, phase shift keying, multi-carrier code division multiple access, and multiple inputs multiple outputs sensor networks. The performance of the proposed approach is evaluated and compared to the performance of the optimal diversity, majority voting, optimal partial decision, and selection diversity in case of binary noncoherent frequency shift keying on a Rayleigh faded additive white Gaussian noise channel. It is shown that the proposed approach achieves considerable performance improvement over optimal partial decision, majority voting, and selection diversity. It is also shown that the proposed approach achieves a performance comparable to the optimal diversity scheme.

Keywords: Decision fusion, binary integrator, spatial diversity, multiple receivers systems.

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