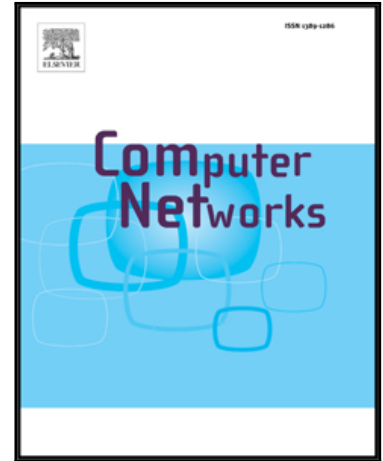


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Optimum Transmission Policy for Remote State Estimation with Opportunistic Energy Harvesting[☆]

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Abstract

An attractive research direction in energy harvesting wireless networks is to balance the energy transfer and data transmission concurrently. In this paper, we consider the scenario that a transmitter can send the state information of a physical process to a remote estimator or deliver the energy to an energy receiver. It is assumed that the communication channels between the transmitter and the remote estimator and energy receiver sides are block fading. We formulate a problem that weighs the estimation error at the remote estimator side with the harvested energy at the energy receiver side. For the case that the realtime channel state information is known by the transmitter (called full channel state information **and FCSI for short**), we respectively find out the optimal transmission power switch policy and power split policy. Moreover, these results are further generalized to the case that the realtime channel state information is unknown and the statistical characteristics of the communication channels are known by the transmitter (called

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