

Jordan University of Science and Technology

Modeling Energy Harvesting Sensors using Accelerometer in Body Sensor Networks

Authors: Muhannad Quwaider and Subir Biswas

Abstract: This paper presents an experimental modeling framework for energy harvesting sensors in Body Sensor Networks (BSN). Most of BSN applications assume that the sensor nodes have infinite and continuous source of energy. But in reality, this may not be true, especially for the implanted sensors. Instead, the energy for the implanted BSN sensors is likely to come from harvested energy sources such as piezoelectric, magnetic, and thermoelectric generators. In this paper we will explore on-body sensors energy harvesting model using acceleration which is getting a lot of attention in the research community. Recharging batteries with harvested energy could not only extend battery life, but may also dissolve the conventional meaning of network life time. While the energy-harvesting sources can vary widely, we will focus primarily on harvesting using vibration of piezoelectric sensors. Since the piezoelectric energy harvesting depends on movements, the amount of energy harvested at a specific on-body sensor node will depend on the movement pattern of the body part that the node is attached to. As a result, the specific energy generation profile at the BSN nodes does depend on the postural body movement patterns over time.