Power and Context Aware Nomadic Devices

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Wireless nomadic devices are becoming more sophisticated incorporating number of power hungry applications. Furthermore, in order to enable seamless and ubiquitous access, a nomadic device needs to be able to process a variety of signals with different bandwidths and modulation formats. Unfortunately, the battery technology is not evolving fast enough and the battery power available to undertake these numerous operations is limited hence, reducing the power consumption is of paramount importance. Power awareness is defined as the ability to minimize energy consumption while changing different operation points. The task in hand is to propose a system which is capable of scaling the power consumption in response to changing operating conditions, thereby consuming the least overall power. One of the expected outcomes of this research work is the application of power-aware design at the RTL level to MIMO-OFDM nomadic devices. This will result in a power-aware device which can gracefully degrade the supplied services according to environmental conditions such as link quality, interference, and available battery power level. Furthermore, since the nomadic device is expected to deal with a portfolio of communications standards, implementing signal processing associated with them in parallel is neither feasible nor desirable. Hence, the second strand of research work will investigate run-time self-reconfigurable MIMO-OFDM transceiver implementation which will enable the device to make decisions independently on which parts of the system to dynamically reconfigure and when to degrade the quality to achieve power-awareness.

Bibliography

