All the data files used are in this directory.

Note: We define packets with RSSI value -100 dBm and LQI value 50 as lost packets.

the "LinkMetrics" subdirectory

We compared RSSI and LQI as indicators of channel quality when the device was strapped on the patient's chest, and patient is standing or resting at different distance and orientation relative to the base-station.

The format of the data file is:

subSeqNo # RSSI # LQI $ txPowerLevel $ seqNo % currentTime & totalRxPkts & CorruptedCrcPkts

the "FixedTxPower" subdirectory

Packets are transmitted at 16 different transmit levels (from maximum 31, 29, …, to minimum 1). The three data files are for normal walk, slow walk, and resting scenarios.

The format of the data files is:

subSeqNo # RSSI # LQI $ txPowerLevel $ seqNo % currentTime totalRxPkts CorruptedCrcPkts

the "OfflineOptimal" subdirectory

We define the "optimal" as the lowest required transmit power level to achieve a minimum target RSSI, and choose a conservative target RSSI of -85 dBm. For each scenarios, we identify the lowest transmit power at which the signal strength at the receiver is no lower than the threshold of -85 dBm (if all received signal strengths are below the lower threshold we set the transmit level to be the maximum).

The format of the data files is the same as the "FixedTxPower" subdirectory.

the "SchemeAdaptations" subdirectory

The following algorithm depicts our class of transmit power control schemes, and is characterized by four parameters: α_{u}, α_{d}, T_L and T_H.

Algorithm 1 A Class of Power Control Schemes

Require: R {RSSI from the current sample}

Require: $\overline{R}$ {Average RSSI}

1. **if** $R \le \overline{R}$ **then**
2. $\alpha_d R + (1-\alpha_d)\overline{R} \to \overline{R}$
3. **else** { $R > \overline{R}$ }
4. $\alpha_u R + (1-\alpha_u)\overline{R} \to \overline{R}$
5. **end if**
6. **if** $\overline{R} < T_L$ **then**
7. Double the transmit power
8. **else if** $\overline{R} > T_H$
9. Reduce the transmit power by a constant
10. **else** { $T_L \le \overline{R} \le T_H$ }
11. No action is required
12. **end if**

We tested the efficacy of the conservative ($\alpha_u = 0.2, \alpha_d = 0.8$), aggressive ($\alpha_u = 0.8, \alpha_d = 0.2$) and balanced ($\alpha_u = \alpha_d = 0.8$) schemes for the three scenarios: normal walk, slow walk and resting.

The format of the data files is the same as the "FixedTxPower" subdirectory.

the "ParametersTuning" subdirectory

We undertook a more detailed study of the impact of the algorithm parameters α_u and α_d on the performance of our class of schemes. We conducted several experiments in which the patient is fairly active, since the parameters have a larger impact on energy and loss under such scenarios.

The data file included is the longer trace data for normal walk, and the format is

subSeqNo # RSSI # LQI $ txPowerLevel $ seqNo % currentTime & totalRxPkts & CorruptedCrcPkts

the “Implementation” subdirectory

We undertook a real-time implementation of our scheme on MicaZ motes to evaluate the efficacy of our power control scheme under imperfect feedback. We presented results with balanced parameter setting $\alpha_u = \alpha_d = 0.8$ for a scenario where the patient undertook a mix of walking and resting.

The format of the data file is

seqNo # RSSI # LQI $ txPowerLevel $ subSeqNo @ last Received Packet Round-Trip Time @ last Received Acknowledgement Packet RSSI & totalRxPkts CorruptedCrcPkts