Ambient intelligence tutorial

Activity recognition with wearable accelerometers

What an accelerometer does

Accelerometer placement

Shimmer accelerometers and a glimpse of TinyOS

Activity recognition with machine learning

Random Forest machine learning algorithm

Machine learning tools

Variants, improvements etc.

Gyroscopes, magnetometers and combining senors with Kalman filter

Ultra-wideband location sensors

Dynamic signal segmentation

Low- and high-pass filter for removing unnecessary signal elements

Feature selection

Smoothing with Hidden Markov Models

Additional tasks related to activity recognition

Fall detection with accelerometers

Human energy expenditure estimation with accelerometers

Detection of unusual behavior

Local Outlier Factor algorithm

Examples of straightforward attributes

Atributes derived from spatial-activity matrix, condensed with Principal Component Analysis