

Probabilistic Fusion of Multiple Distributed Sensors

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DESCRIPTION:

The human perception of the environment is determined by the fact that a large number of sensory impressions are recorded and processed simultaneously by the brain. The combination of these individual information ensures that humans are able to resolve perceptual ambiguities. Based on this concept, in the present work different applications are shown in which a variety of sensors are fused. Most of these sensors are built into wearable devices such as smartphones or smartwatches.

In particular, a codebook-based feature learning method is described which utilises wearable sensors to identify the current activity of a user. Characteristic features are extracted from time series data and are used together with a Support Vector Machine for the classification task.

For the problem of indoor localisation different statistical methods are introduced that are embedded in a recursive state estimation framework. The system introduced here fuses data from accelerometers, gyroscopes, barometers and Wi-Fi measurements to track the position of a person inside a building.

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