



Abstract:

**Acoustic scene analysis
for the ambient communication
within the connected home**

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The research scenario of the connected home describes an environment, where devices and services communicate with each other sharing a common network. If the system design follows the ideas and concepts of ambient intelligence, the environment will be able to react adaptively on users and events. For this the underlying systems use different kinds of sensors, whose signals are processed and analyzed. The retrieved data include information about the context the system is used in and thus represent the necessary basis for ambient intelligence to be realized.

In this thesis a new method for the acoustic scene analysis is proposed, which analyzes data streams of acoustic signals with a low latency. The acoustic data provides information about users, events and their position within a room. As an extension the combination with a face identification is shown. This results in a system for audio-visual speaker identification. Here the camera is focused on speakers according to acoustic position estimates and detected faces.

The integration of the acoustic scene analysis in the concept of the connected home is realized by using a middleware. The information from the acoustic scene analysis is described according to an ontology and subsequently provided to other services via standardized interfaces.

In conclusion a system for ambient communication is considered as an example of a context-aware application. It uses the audio-visual camera control and the information gathered by the acoustic scene analysis to give the user a maximum degree of mobility in the home environment during a communication. The ambient communication system is integrated as a part of the connected home middleware.