

Speech Recognition as an Aid for Caring for the Impaired

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The quest for more intuitive human – machine interfaces are perpetual, with the ultimate goal being the so called natural human computer interaction that is indistinguishable from the interaction with a competent human helper. Speech recognition is an indispensable part of any such interface, as humans tend to use spoken language as the primary means of communication. Current research aims to develop innovative speech recognition algorithms for ubiquitous natural human computer interaction. Smart devices existing and operating in an environment, are required to monitor and follow the ongoing events in order to provide increased comfort, functionality, autonomy, health monitoring, diagnostic support and training to their users. These principles apply to automated isolated word recognition systems, used for command recognition, emergency management, hands free interaction etc. This presentation will focus on technologies suitable for the purpose of monitoring medical problems, promoting general health and providing assistance with equipment control for both impaired and able – bodied individuals. These algorithms are based on the use of selected speech features relevant both to efficient speech recognition but also to the detection of short, medium and long-term health problems and chronic health conditions. The decisions need to be based on context – adaptive principles, tracking the evolution of the articulation of speech and the semantic context it implies, along with its implications for the health state of the subject. The techniques are suitable for smartphone and embedded device platforms. Applications in health monitoring are investigated, with emphasis on the case of stuttering.