Tanja Schultz (University of Bremen)

"Biosignal-based Spoken Communication"

Speech is a complex process emitting a wide range of biosignals, including, but not limited to, acoustics. These biosignals – stemming from the articulators, the articulator muscle activities, the neural pathways, and the brain itself – can be used to circumvent limitations of conventional speech processing in particular, and to gain insights into the process of speech production in general. In my talk I will present ongoing research at the Cognitive Systems Lab (CSL), where we explore a variety of speech-related muscle and brain activities based on machine learning methods with the goal of creating biosignal-based speech processing devices for communication applications in everyday situations and for speech rehabilitation, as well as gaining a deeper understanding of spoken communication. Several applications will be described such as Silent Speech Interfaces that rely on articulatory muscle movement captured by electromyography to recognize and synthesize silently produced speech, Brain-to-text interfaces that use brain activity captured by electrocorticography to recognize speech, as well as brain computer interfaces based on near infrared spectroscopy.