Using Accelerometer Data to Predict Hyperactivity in Children

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ADHD is a disorder that can lead to great impairments in everyday lives. Hence, an effective detection of ADHD symptoms is necessary. Due to the high prevalence of ADHD, this detection should be time- and cost-effective. Here, we focus on the core symptom hyperactivity, which is partly expressed by fidgeting and troubles with sitting still. It seems reasonable to assume that hyperactivity, as expressed in increased or divergent movement, can be assessed with the use of accelerometers. About 100 participants (8-12 years) wore an accelerometer while working on a cognitive computerized task and sitting on a chair for about fifteen minutes. A part of these children has been diagnosed with ADHD. We try to replicate this diagnosis, based on accelerometer data. In order to do that, we will analyze the data with S*upport-Vector-Machines* (Boser, Guyon & Vapnik, 1992; Cortes & Vapnik, 1995). S*upport-Vector-Machines* are an effective and flexible tool for classification problems. In a previous project, we successfully used S*upport-Vector-Machines* to identify activities from participants' accelerometer data (Kühnhausen et al., 2013). Here, we will use S*upport-Vector-Machines* to identify differing patterns in the movements of children with or without diagnosed ADHD. These patterns can then be used to identify hyperactivity in children, based on accelerometer data. Since this method could be applied in large groups (school classes), it would allow to identify children showing symptoms of hyperactivity with little effort and could contribute to the early detection of children who show signs of ADHD, aiding and simplifying their diagnosis and treatment.

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