Tracking Essential Tremors

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Essential tremor, which affects millions in the United States, is a progressive and incurable movement disorder characterized by uncontrollable shaking of the hands and arms during voluntary muscle action. While treatments such as the beta blocker propranolol (Inderal) or anticonvulsant primidone (Mysoline) can help alleviate symptoms, their efficacy and duration of effectiveness varies significantly depending on the subject. Currently, it is difficult to track essential tremor severity at home or workplace, which can be extremely valuable when attempting to track the progression of essential tremor over the course of years or when analyzing the effects of different factors and treatments on tremor severity. This self-case study focused on creating an essential tremor tracking device based on an Arduino controlled accelerometer to identify the effectiveness of symptomatic treatments. Specifically, the device was used to test the efficacy of propanol as a symptomatic treatment for the subject by tracking the subject's tremors over many hours and computing various statistical quantities from the physiological data. To circumvent the significant noise characteristic of biological systems, the time courses of these quantities were studied to identify the best candidate that quantifies propanol's effect on tremors. The analysis was further extended to track the effect of different stressors, such as sleep deprivation, on the subject's tremors. The results of the researcher's experiment demonstrated a capacity for tremor tracking devices to be a valuable method for monitoring and controlling essential tremor.

Awards Won:
University of Texas at Dallas: Scholarship of $5,000 per year, renewable for up to four years