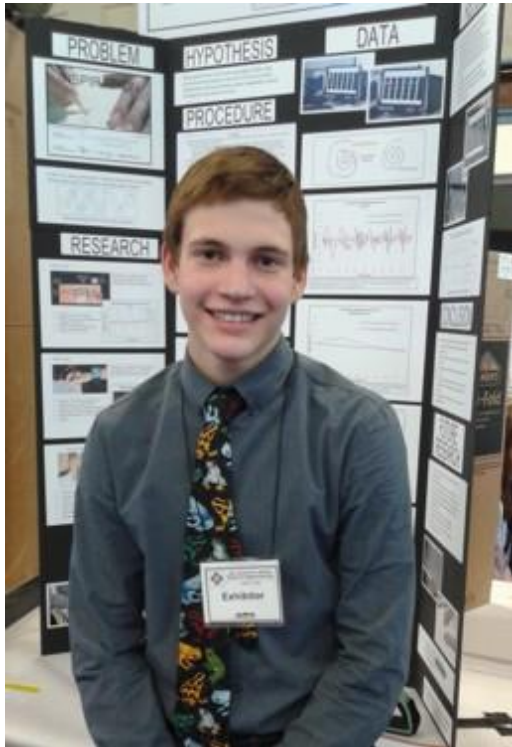


2016 State NMJAS Research Paper Competition Winner

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Passive Reduction of Involuntary Arm/Hand Tremors Phase III

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ABSTRACT

In the U.S., millions suffer from life-impairing involuntary shaking of muscles called tremors. Tremors are caused by a variety of diseases, injuries and conditions, including traumatic brain injuries, Parkinson's disease, multiple sclerosis, and medications. Tremors cause difficulty with fine motor control. The objective of this research was to use data gained from the Electromyograph sensors (EMGs) and accelerometers placed on the arm to reveal a direct relationship among a motion damping brace, tremor magnitude, tremor frequencies and muscle activity. The brace, worn between the wrist and elbow, is lined with viscoelastic foam, and constructed with a lightweight ridged plastic outer shell that rests on a writing surface. To test its effectiveness, human volunteers performed fine motor control tasks with and without the brace. Testing was conducted at the UNM Department of Physical Therapy Motion Analysis Lab. The tasks revealed how much the tremor was reduced both numerically, by analyzing the data collected from surface EMGs and accelerometers, and visually, through inspection of the test results. Results showed that the brace is effective at reducing the severity of a tremor and improving fine motor control of six out of the eight subjects. This warrants further research into hand stabilizing equipment.