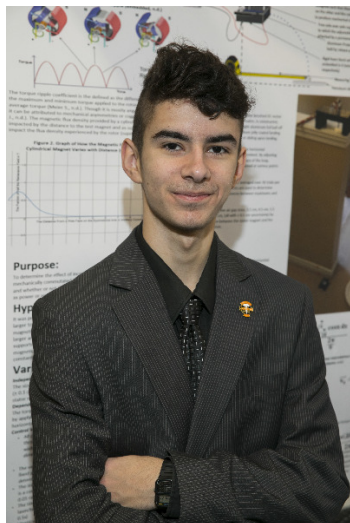


CWSF 2017 - Regina, Saskatchewan



Sergiu Pocol

Air Gap Thickness and Torque Ripple Induced by Asymmetries

Challenge: Discovery

Category: Senior

Region: Waterloo-Wellington

City: Kitchener, ON

School: Cameron Heights C.I.

Abstract: In haptic devices, direct drive actuators perform optimally with low torque ripple, the variance in the output torque of a motor. The effect of the thickness of the air gap on torque ripple was determined in a mechanically commutated DC motor, wherein the rotor's mass is asymmetrically distributed. A loose positive correlation between the two was noted, while power showed a negative correlation.

Biography

My name is Sergiu Pocol and I am a grade 11 student in Kitchener, Ontario. Being a physics enthusiast, my experiment involves the determination of torque related parameters in asymmetric motors and how the thickness of the air gap might affect them. Many direct drive actuators require low torque ripple, which is a negative quality in motors. As such, I wanted to develop an easy and accessible method for investigating torque ripple, relying on physics and calculus. In spare time, I enjoy volunteering at summer camps and cycling. Also, I am a member of a local choir and orchestra and enjoy both playing and listening to music. Furthermore, I am an avid science lover and have participated in related programs like Gene Researcher for a Week. As I am an ardent reader, I have won first prizes at the Waterloo County English Awards.

Awards

Value

Excellence Award - Senior - Silver Medal Sponsor: Youth Science Canada	
Dalhousie University Faculty of Science Entrance Scholarship Senior Silver Medallist - \$2500 Entrance Scholarship Sponsor: Dalhousie University, Faculty of Science	\$2 500
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Western University Scholarship Silver Medallist - \$2000 Entrance Scholarship Sponsor: Western University	\$2 000
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