

# CWSF 2012 - Charlottetown, Prince Edward Island



## Nick Johnston

### Unspoken Speech Detection Using a Non-Invasive Brain Computer Interface

**Challenge:** Innovation

**Category:** Senior

**Region:** South Fraser

**City:** Surrey, BC

**School:** Semiahmoo Secondary

**Abstract:** An 8 channel EEG device was constructed using an Arduino microcontroller and a TI ADS1298 in order to detect imagined musical note rhythms. A five letter word represented by 5 individual rhythms was detected in an average of 39.3 seconds using a novel classification method. This is quicker than the existing P300 Speller mechanism, known to detect a 5 letter word in 105 seconds.

### Biography

Nick Johnston is a grade 11 student at Semiahmoo Secondary School in Surrey, British Columbia, where he maintains a 90 and above average. His main scholastic interests are in the areas of computer science, engineering, physics and programming. Nick one day aspires to be a computer engineer. Outside of school Nick enjoys swimming, ice hockey, mountain biking, running, and is working towards his black belt in Mixed Martial Arts. Being very interested in travel, Nick participated in a French exchange program two summers ago in the south of France. He has hopes of one day visiting all seven continents.

### Awards

### Value

Excellence Award - Senior - Bronze Medal Sponsor: Nuclear Waste Management Organization	\$300
University of Ottawa Entrance Scholarship Senior Bronze Medallist - \$1000 Entrance Scholarship Sponsor: University of Ottawa	\$1 000
Western University Scholarship Bronze Medallist - \$1000 Entrance Scholarship Sponsor: Western University	\$1 000
<b>Total</b>	<b>\$2 300</b>