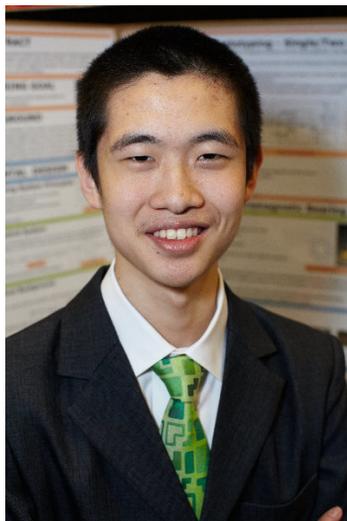


# CWSF 2012 - Charlottetown, Prince Edward Island



## Zeyu Liu

### A Novel Approach to Electromagnetic Bearing Systems

**Challenge:** Innovation

**Category:** Senior

**Region:** Calgary Youth

**City:** Calgary, AB

**School:** Sir Winston Churchill High School

**Abstract:** A simple, low-cost, PD controlled magnetic bearing system was successfully designed and built using both electromagnets and permanent magnets. Test results demonstrate that the system is safe and reliable, more efficient than conventional mechanical bearings, and uses less energy to operate than regular magnetic bearings. This hybrid magnetic bearing system can be easily applied to consumer applications like electric cars and wind turbines.

#### Biography

My name is Zeyu Liu, I live in Calgary, Alberta, and I really like science and technology. In the past, I have attended the 2011 Intel ISEF, 2010 CWSF, and many local fairs. I was fortunate to win numerous awards, but more importantly, I learned so much and gained many valuable experiences. My involvement in the RIM/Shad Entrepreneurship Cup made me recognize that combining our technical skills and creativity can make impacts on society. Along the same lines, my projects focus on engineering and technology that can benefit mankind in practical ways. From my PLC Controlled Robot and Traffic Light Fuzzy Controller to my Electromagnetic Bearings, my inspiration comes from real world problems and my ambition to make things better. I believe that progress happens best when people work on problems that are close to their hearts and that they are passionate about. I chose this magnetic bearing project because I want to bring the benefits of magnetic bearings to consumer products. I will continue my research to make them more adaptable and to replace conventional bearings in many applications in the future. It is satisfying to know that my projects may improve efficiency and human well-being in the future.

#### Awards

#### Value

The Manning Innovation Achievement Award Sponsor: Ernest C. Manning Awards Foundation	\$500
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>\$2 800</b>