CWSF 2019 - Fredericton, New Brunswick

Lily Smales

Convolutional Neural Network to Detect Eyes with Visual Impairment

Challenge: Innovation
Category: Junior
Region: Bay Area
City: Oakville, ON
School: W. H. Morden Public School
Abstract: This project's purpose is to be a pre-diagnosis tool for people in remote areas, who can't easily travel great lengths for an ophthalmologist. This was achieved using a convolutional neural network. Images of healthy and at-risk eyes were placed into the network. This network was trained on the data, and could identify a healthy or at-risk eye with 85% accuracy on unseen data.

Biography
My name is Lily Smales, and I'm a grade 8 Student at W. H. Morden Public School in Oakville, Ontario. My favourite subjects are math and science. In my spare time, I like public speaking (in both English and French), participating in musical extracurriculars (choir, drumline, wind ensemble), being a member of my school's Change Club, Halton Skills, and Lego Robotics. This project is a continuation of my project from last year, which was inspired by a National Geographic article I read about eye disease. After reading the article, I became interested in the idea of a simple, affordable diagnosis tool, and I created a paper eye test that could be administered at home. This year, I combined my interest in machine learning with my interest in healthcare, to find a simpler way to administer this test, using neural networks. In the future, I plan to improve and combine the two tests, and potentially create something that could be applied to help those who don't have easy access to an optometrist or ophthalmologist for eye diagnosis.

Awards	Value
Excellence Award - Junior - Bronze Medal Sponsor: Youth Science Canada	
Western University Scholarship Bronze Medallist - $1000 Entrance Scholarship Sponsor: Western University	$1 000
Total	$1 000