

CWSF 2015 - Fredericton, New Brunswick



Nicolaas Doyle

Experiments in Collective Robotics

Challenge: Information

Category: Intermediate

Region: Niagara

City: Grimsy, ON

School: Grimsby S.S.

Abstract: Collective robotics is the use of multiple robots to complete a task. I conducted an experiment to determine if a collective advantage exists in a group of primitive robots due to stigmergy. In other words, I investigated whether the work completed by two robots could be more than twice the work of one. I also built an autonomous robot with sensing and communication ability.

Biography

My name is Nicolaas Doyle and I come from Grimsby Ontario. I am in Grade 9 at Grimsby Secondary School. In my spare time I enjoy swimming, biking, playing recreational water polo, saxophone, and racing remote controlled (RC) cars. Picking a topic that interests you is key to a successful project. In the news, there have been reports about sending spacecraft to extraterrestrial destinations, to build a liveable habitat for humans. It got me thinking about what would be the best way to accomplish this task. Sending a single highly advanced robot to construct a habitat, could backfire if the robot malfunctions. I remembered a magazine article I had read about collective robotics, which is the use of multiple robots to accomplish a task. I think this may be the best way to succeed in such missions. This motivated my science fair project in which I did experiments to test for a 'collective advantage'. In other words I was looking to see if the work completed by a single simple robot could be more than twice the work of two. Collective robotics can be used in situations other than space travel such as search and rescue, clean up, and construction.

Awards

Value

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| Excellence Award - Intermediate - Bronze Medal Sponsor: Youth Science Canada | |
| Challenge Award - Information - Intermediate Sponsor: Youth Science Canada | |
| Western University Scholarship Bronze Medallist - \$1000 Entrance Scholarship Sponsor: Western University | \$1 000 |
| Total | \$1 000 |

