Swarm Intelligence with LEGO NXT

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ABSTRACT

We report an exploratory project to provide research experiences on swarm robotics to high school students. A group of three simple LEGO NXT robots was used to study 'search and rescue' operation. A bio-inspired global optimization technique called particle swarm optimization (PSO) was used as the main algorithm. Each robot was placed in pre-defined positions with a target position corresponding to a single target. The robots would search in spirals till the target was found by any one of the robots. Once the target was detected the robots would reach the target using the PSO algorithm. Results of initial exploratory efforts were encouraging. The students got a first-hand experience of implementing swarm robotics as a real-time engineering application.