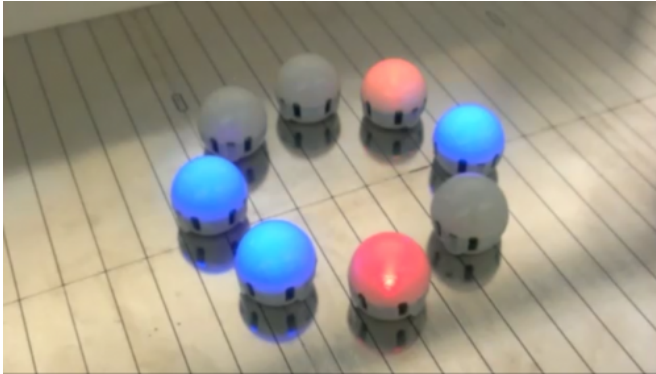


Boulder swarm effort turns to crowdfunding for Droplet mobile robots (w/ video)

8 May 2014, by Nancy Owano



University of Colorado, Boulder researchers seek to build a swarm of Droplet robots and have turned to crowdfunding. They have been working on a robotic [platform](#) to study swarming behavior; their goals are to test swarming algorithms on a large scale, bring Droplets into college classrooms, use Droplets to teach K-12 science, and provide Droplets for artistic use. John Klingner, PhD candidate, computer science, said "We are ready to scale up" and they would now like to buy parts and pay for 1,000 robots to be assembled. Droplets are an experimental research and educational platform, for large-scale swarming research, using an MIT [License](#)

A Droplet is a small mobile [robot](#). The platform features include moving and communicating omnidirectionally. The platform has three components, the hardware, the embedded software and the [software](#) simulation environment. The required infrastructure includes a powered floor. The hardware component includes the actual robot and the test bed/floor that experiments are run on. The robots are Ping-Pong ball sized devices. They have RGB color and IR sensing, actuation using vibration motors and

communication, using analog/digital IR sensors.

Nikolaus Correll, assistant professor, [computer science](#), said that after working on this [robotic platform](#) they have now reached a stage where they want to mass-produce them. The team has used a promotional video to highlight the potential educational value of their Droplets platform. Klingner spoke about bringing the technology to a wider arena of students. He talked about their hopes in giving small groups of students, say, 30 robots, with which they could test out some simple swarm algorithms individually and then, at the end of the course, bring all 300 or so robots together for a more complex task. Correll said the Droplets would be valuable for use in high schools as well: "We are also looking to collaborate with local high schools in the area and use the swarm" to teach them not only about swarms but maybe also about organic chemistry, math, geometry and the immune system.

His interest in the Droplets project reflects his deeper interest in what such scientific exploration can reveal. "The entire world is actually a swarm so everything you see is just a swarm of atoms working together and at some point those atoms make a cell and at some point those cells make molecules; they make brains; they make livers; and hearts." At the end of the day, he said, "all of these things are swarms." As such, Correll said he was "very curious to understand what the principles and mechanisms are that drive these things." Taking these robots and programming them, he added, might increase an understanding of how to recreate such phenomena.

In addition to educational value, Klingner noted that one of the things they were thinking about is mapping an oil spill. Anshul Kanakia, PhD candidate, computer science, noted a scenario where one is out in the ocean, not knowing where the spill begins, and wanting a good realtime map of the spill. Each individual robot could make a

guess, all go up and surround it and "talk" to each other.

More information: *

www.colorado.edu/crowdfunding/...ect&project_id=10341

* correll.cs.colorado.edu/?page_id=2687

via [IEEE](#)

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