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Robot masterminds plot reef rescue

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At a speed-dating night for nerds, the talk isn't about love or even real estate investment - it's all about finding new friends with which to team up and save the world.

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At such a night in Edinburgh, deep-sea biologist Lea-Anne Henry had 60 seconds to connect with artificial intelligence wizard David Corne.

"I said 'I need to find some way to get a robotics system down to repair our coral reefs.' He said, 'I have a solution to that.'"

Professor Corne, from the School of Mathematical and Computer Sciences at Heriot-Watt University, was working in "swarm intelligence", an emerging technology where robots in large numbers work in a coordinated fashion.

Dr Henry, speaking from Edinburgh, says: "He suggested a swarm of robots could rebuild the reefs, working like ants or bees, in the way they rebuild a nest."

From that conversation 18 months ago, Coralbots - a project dedicated to making Corne's vision come true - was born. The team includes a computer vision scientist, and engineers who had already been working with underwater robots doing repair work for the petroleum industry. "We're working to adapt those robots for our mission," says Henry.

The robots would basically scavenge fragments of dead coral, pile these up to make a base for a new reef, and then hunt down fragments of live coral to pile on top.

"One challenge is to make sure the robots grippers (hands) don't crush the coral ... we haven't got that far yet," says Henry.

For the past year or so, using a large library of images, the team has been training the computer software to recognise corals - dead and living fragments - and distinguish them from sponges and rocks, with a 75 per cent success rate so far.

"We've also been working on making sure the robots don't crash into the coral," says Henry. "And we have to train them to hover which is proving tricky. Robots have a terrible time hovering."

Britain has deep-sea cold-water reefs that aren't as pretty as tropical reefs, but do the same work of protecting coastal areas from violent seas and sediment build-up, and supporting large ecosystems. The British reefs are routinely damaged by bottom-trawling and fishing.

The initial testing of the coralbots, however, will take place off the coast of Belize, which is home to the second largest coral reef in the world, after Australia's reef. "We need to run a proof-of-concept exercise in shallow water before dropping these things into deep water."

The group recently received a large grant from the UK government to fund equipment, but Coralbots is also taking the online crowd-funding route - via the Kickstarter platform - to pay for testing and development. Donors are rewarded with recognition (\$15 gets your name on a coralbot) and T-shirts.

Could coralbots help save the Great Barrier Reef? "It would take us 15 years to get the project up to that scale,"

says Henry.

Whether or not our reef can wait 15 years is another question.

This story was found at: <http://www.smh.com.au/environment/conservation/robot-masterminds-plot-reef-rescue-20130907-2fc48.html>
