

Robot arm at MIT will weave its own web (w/ Video)

April 29 2012, by Nancy Owano

(Phys.org) -- The Mediated Matter Group from the MIT Media Lab is working on a robot that might one day spin its own webs. Project team members are training a robot to weave a web-like architecture, similar to the way a silkworm creates cocoons. The team seeks to train its robot to mimic nature—namely to weave a cocoon like structure. The robot is getting some programming help but eventually the researchers want to see it weaving autonomously, spinning its own web. Latest reports reveal a robot arm deploying yarn-like thread on prearranged hooks.

The [robot](#) knows the positions of all the hooks and pegs that surround it. With more work the goal is for the robot to sense its surroundings and build a custom structure.

Talking to the IDG News Service, Elizabeth Tsai, a research assistant at the Media Lab, said they are looking at "a manufacturing process that looks at its surroundings -- say branches or pegs -- that it can weave around." The design presently is preprogrammed. The team will switch weaving materials to a moist nylon substance that hardens as it dries, according to the plan.

The project also sheds some light on what the Mediated Matter agenda is all about. Their research interests suggest outcomes that may change how we think about architecture and manufacturing. The Mediated Matter Group defines itself as exploring how digital and fabrication technologies mediate between matter and environment to radically transform the design and construction of objects, buildings, and systems.

Related to the robotic arm, the group has an ongoing project, CNSILK, which stands for Computer Numerically Controlled Silk Cocoon Construction. This is described as "a novel approach to the design and fabrication of silk-based building skins by controlling the mechanical and physical properties of spatial structures inherent in their microstructures using multi-axes fabrication."

As for the [robot arm](#), the team members talk about the robot in relation to the principles of "additive manufacturing." This is a process where parts are created by successively melting layers of a material. Each layer is melted to the exact geometry defined by a 3D CAD model. Proponents say this is an approach with numerous benefits, and without manufacturing constraints, as it allows for building parts with complex geometries without tools and without waste material.

Though still in an early project stage, bloggers this week wasted no time thinking about what could come out of the attempt. Writing in Co.DESIGN, Mark Wilson [imagined](#) the potential for prefabricated structures: "Your house could ship to you in a flat-packed accordion lattice. You simply pitch the house like a tent, and an autonomous robot could come in and weave a flowing, organic structure from the slightest of frameworks with a level of artisan craftsmanship that no human team could duplicate."

A post in the Geek Church suggested that [construction](#) workers, after making a building with scaffolding, would have robots fill in the rest. Another site offered the idea of a robot creating [hammocks](#) on demand.

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