

DARPA issues robot challenge to clothing imports

10 June 2012, by Nancy Owano

(Phys.org) -- Sewing machines that sew by themselves are on the research boards at Defense Advanced Research Projects Agency (DARPA). When concept becomes real, automated sewing without the need for human labor might raise concerns about lost jobs. The advent of automated sewing machines will also affect talk about garment-production conditions and wage levels for some 500,000 workers employed by contractors to make military uniforms. Overall, automated sewing machines might even reinvent clothing production in the U.S, which imports about \$100 billion worth of clothes and sewn items each year from countries including China and Vietnam.

The stated goal of the agency is for "complete production facilities that produce garments with zero direct labor."

On June 5, [DARPA's contract award announcement](#) was made, of \$1.25 million to a Georgia Tech spinoff, Softwear Automation. The company believes automated sewing would allow cutting and sewing at costs "less than in [China](#)." The company is on a mission to develop what is termed by the DARPA notice as "Automatic Sewing of Garments Using Micro-Manipulation."

The notice synopsis says that "Softwear Automation will develop a complete work-cell called a Beta Unit. That includes a numerically controlled sewing machine that tracks fabric movement by observing passing threads and under servo control moves the fabric under the needle stitch by stitch."

SoftWear Automation has so far developed "a conceptual" version of the system. A note appears on the Softwear Automation site to say that this is a site only for development. "SoftWear Automation, Inc. working with various partners intends to convert a labor-intensive industry to one that is capital-intensive."

The company says an innovation required is that the metric of motion is not meters or inches but rather thread count in the fill and warp directions. An overhead, pick-and-place robot grabs the fabric pieces and places them at the head of a sewing machine. The system relies on a precise monitoring of a fabric's thread count to move it through a sewing machine in the proper direction and at the right pace.

In this concept, the device has machine-vision capabilities that can spot and track individual fabric threads. Fabric location information in turn goes to actuators that operate the needle and thread. Budgers, or motorized balls, under the sewing machine latch on to the fabric, moving the [fabric](#) to and fro.

Steve Dickerson, the company CEO, has expressed concern that the fabrication of sewn items is a business that has almost entirely disappeared from the United States. He and members of his research team have been working on "robo-tailoring" for some time, hoping to advance the technology.

More information:

smartech.gatech.edu/xmlui/bits...

[inalv.pdf?sequence=3](#)

www.wired.com/dangerroom/2012/06/darpa-sweatshop/

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