UNH Researchers Develop "Smart" Machining Tools To Boost U.S. Manufacturing

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DURHAM, N.H.— Recent research breakthroughs from the University of New Hampshire’s College of Engineering and Physical Sciences could make United States manufacturing smarter – and more competitive.

Robert Jerard and Barry Fussell, both professors of mechanical engineering, and doctoral candidate Chris Suprock have developed technologies that make machining tools smarter.

They’re bringing their technologies to market thanks to entrepreneurial partnerships.

Such research could help manufacturers in the U.S. regain a competitive edge against the lower labor costs and similar factors that have given many developing nations the upper hand in manufacturing, the researchers say.

“It provides us with the only competitive edge possible by allowing American manufacturers to become more productive, efficient and cost effective, therefore decreasing the impact of labor cost differences,” says Jerard. “In effect, by helping to level the playing field, such technological advancements could mean a more positive future for U.S. industries.”

Jerard and Fussell, in collaboration with entrepreneur Donald Esterling, have developed software programs to make machine tools work smarter by assessing their cutting efficiency. Their work has resulted in cncAdvisor™, a software program released by Esterling’s high tech specialty firm Veritas CNC. The software is based upon experiments that assessed the best speed for machining tools to cut metals and other components.

In the pipeline is Esterling’s pending cncPerformance™, also based on Jerard and Fussell’s research. Available in the marketplace later this year, cncPerformance™ will help better gauge the life span of machining tools, enabling manufacturers to more accurately predict how long a machine tool can operate efficiently.

“Machine shops can then save money and become more productive by avoiding work slowdowns and disruptions caused by defective tools,” says Esterling.

Suprock, a Ph.D. student in mechanical engineering, is using wireless technology to help machine tools to "learn" how to operate more productively.

His efforts began two years ago, when he disassembled a Bluetooth wireless headset and installed its components into a machining cutting tool. When operated, the tool transmits real-time information for the best possible settings for speed, direction, power and other operational features. Such data enables machining tools to function at top efficiency and, as a result, avoid repairs and replacements that drive up manufacturing costs.
Suprock's work has led to the formation of his own company, Exeter-based Suprock Technologies, which will market his software to aerospace and automobile manufacturers for high-end machining.

The University of New Hampshire, founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea, and space-grant university, UNH is the state's flagship public institution, enrolling 12,200 undergraduate and 2,300 graduate student.

Photograph available to download:
www.ceps.unh.edu/images/smart.jpg
UNH mechanical engineering professors Barry Fussell (left) and Robert Jerard (right) with graduate student Firat Eren are working together to develop "smart" machining systems in the Design and Manufacturing Lab. Courtesy photo.

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