NIU engineers make micro-milling affordable

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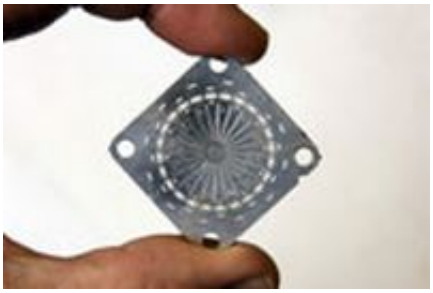

(PhysOrg.com) -- The Northern Illinois University College of Engineering and Engineering Technology has created a new micro-milling machine that could open doors for small machine shops looking to manufacture the tiny parts demanded in the medical, military and aerospace fields.

Working with almost all “off-the-shelf” parts (including a motor from a radio controlled helicopter to power the spindle) faculty, staff and students in the college’s Department of Technology have created a machine that can make cuts to an accuracy of +/- 2 microns. For comparison, a human hair is about 50 microns wide.

The $25,000 machine is capable of handling most jobs performed by commercially manufactured micro-milling machines which typically

retail at four times (or more) the price.

“Our tolerances aren’t quite as tight as the high-end machines, but for most jobs it is more than adequate, and our machine can perform all the functions of those more expensive devices,” says Cliff Mirman, chair of the college’s Department of Technology where the machine was built.

The project was launched under auspices of NIU’s ROCK program, which focuses much of its efforts on revitalizing manufacturing in northwestern Illinois, particularly in and around Rockford, by finding ways to get companies from that area into the supply chain for the Department of Defense.

The many small machine shops in Rockford are well positioned to take on the type of low volume, high precision work often demanded by DOD contracts, but most could not afford the price tag on the commercial micro-milling machines. The NIU model could make it feasible for those shops to compete for contracts to make the tiny gears, switches, sensors and other parts demanded in modern weaponry, air craft and medical devices.

“One of our goals at CEET is not just to train our students in the latest technology, but to also introduce that technology to our region so that northern Illinois remains a competitive player in the global marketplace. I truly believe this machine will do just that,” said Promod Vohra, dean of the engineering school at NIU.

The machine, which is essentially a factory small enough to fit on a desk top, is deceptively simple in appearance and easy to operate, say its inventors.

“You plug it into the wall and hook your computer into it, connect the control box and away you go,” says Donald Shields, 23, a senior

electrical technology major who was an instrumental part of the team that created the device. Shield's many contributions included writing code to translate directions from software into actions that the motor could interpret and perform.

The machine could also be a boon to universities, community colleges and technical schools, says Mirman. "The need for these small parts is continually increasing, and we need people who understand how to use this machinery. This will enable schools to provide that training without tremendous cost," he says.

While Mirman says the machine is "not quite ready for prime time" a Savanna, Ill., company has already ordered one of the devices, and several area companies have given the machine enthusiastic reviews after seeing demonstrations.

Provided by Northern Illinois University