

New Scale News

October 2012

Greetings!

2012 marks New Scale's 10th year of putting **small, precise and smart** systems into motion for you. We've made our piezoelectric motors 500x smaller - and the drive electronics 10,000x smaller, as well as smarter - since releasing our first SQUIGGLE motors in 2004.

In this issue we highlight a few of our latest projects with new videos and technical papers. Applications include a small hand-held optical-based device, robots for astronomy, and an endoscopic surgical tool.

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~ Eight axes of motion in 80 mm, 0.5 micron precision

We recently applied our M3-L technology to solve an optical alignment problem in a new and highly miniaturized instrument.

For this project we integrated four, 2-axis smart linear positioners into an 80 mm space. Each positioner has two axes of motion and resolution of 0.5 micrometers. All eight axes are independently controlled.

Each positioner is a "smart" system integrating two piezoelectric SQUIGGLE micro motors, position sensors for closed-loop feedback, a motor drive ASIC and a microprocessor with embedded firmware.

- [Watch the video](#) (1:50)



Video: 8-axis smart motion system in action

~ Miniature high-torque SCARA robot positions optical fibers

We have new video of the miniature SCARA robot developed for NASA's Jet Propulsion Labs. The "Cobra" positioner can quickly position an optical fiber anywhere in a 9.5 mm diameter patrol area with high accuracy and no backlash.

The 7.7 mm diameter robot consists of two high-torque rotary piezo motors in a theta-phi configuration. The positioners -- 2,394 of them -- will be arranged in a close-packed hex array at the prime focus of the Subaru telescope. They will rapidly move 2,394 optical fibers to the image positions of astronomical targets in the focal plane.

Updated design and test results were presented at the



- [Watch the video](#) (2:52)
- [Read the updated application note](#) and download or request technical papers

~ Endoscopic laser scalpel improves head and neck cancer surgery

With researchers at Memorial Sloan Kettering Cancer Center in New York, we developed an endoscopic laser system that incorporates a miniature dual wedge beam steering device, a video camera, and the control system for remote and /or robotic operation. The dual-wedge Risley device offers the smallest profile possible for endoscopic use.

This new device was developed to overcome one of the main barriers preventing the use of lasers in endoscopic surgery: the difficulty of bringing the laser into the endoscopic cavity.

The team from MSKCC presented their work at the 2012 SPIE Photonics West / BiOS Conference. They include clinical specifications, design considerations, descriptions of the device and the development of its control system.

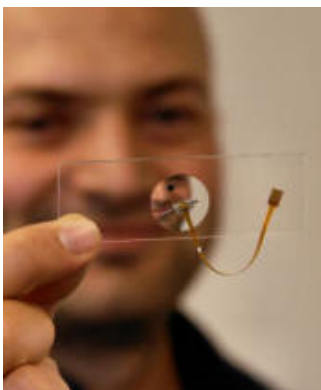
- [Read more about the laser scalpel project](#)
- [Request a copy of the SPIE technical paper](#)



photo: MSKCC Center News Magazine

Memorial Sloan Kettering Cancer Center researchers Milind Rajadhyaksha, Snehal Patel, and Ricardo Toledo-Crow discuss the endoscopic laser scalpel project

~ Seventh patent for New Scale Technologies



The reduced-voltage SQUIGGLE micro motor and drive ASIC are displayed by Daniele Piazza, Ph.D., co-inventor with Qin Xu and David Henderson of the newly patented technology.

New Scale received its seventh U.S. patent for piezoelectric motion technology in July, for the reduced-voltage miniature piezoelectric motor and drive system capable of operating directly from battery voltage as low as 2.3 VDC.

By eliminating the need for boost circuits, this invention reduces system size and component cost and enables integration into a wide range of battery-driven products to move elements such as optical lenses.

Since 2002, New Scale has secured seven US patents and corresponding international patents for piezoelectric motors and motion systems with unmatched miniaturization, micrometer-scale resolution, fully-integrated microelectronics and intelligent firmware. The company both licenses this technology and applies it in custom development projects for original equipment manufacturers in consumer imaging, security, medical, scientific and other markets.

- [Read the news release](#)

~ Technical paper: Micro-scale smart actuator modules for imaging systems

Presented at Actuator 2012

June 18-20 | Bremen, Germany

by New Scale founder and CEO/CTO David Henderson



Abstract

Micro-scale smart actuator modules have recently been commercialized for imaging systems. These products provide a complete motion solution that requires only battery power (3.3 VDC) and high-level digital commands (I2C or SPI) to produce precise step and velocity control. Extreme miniaturization is achieved using the latest innovations in piezo motors, drive electronics, position sensors, and microprocessors with embedded firmware. One "killer application" for micro motion is imaging and this market is projected to grow from 1.7 billion image capture devices in 2011 to 2.8 billion in 2015.

New Scale Technologies, Inc. has commercialized the UTAF® (Ultra Thin Auto Focus) and M3-F (Micro Mechatronics Module) systems for micro imaging applications. The UTAF module is used in mobile phone cameras with movement less than 300 micrometers and lens mass less than 0.5 grams. The M3-F module is used for non-consumer applications such as iris imaging, facial recognition and medical devices with movement greater than 1.5 millimeters and lens mass up to 5 grams. These new smart actuators enable "plug and play" integration, rapid prototyping and faster times to market.

- [Download the paper](#) (611Kb PDF)

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