

## Nonexclusive Licensing Pays Off For MEMS Actuator

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Gaining exclusive access to a new invention or idea is a common and important business strategy for technology companies. Many inventions lend themselves to this licensing approach but others have broad application or offer such a clear advantage that a better strategy for the inventor is to offer non-exclusive licenses to many adopters. Using just such an approach, the University of California, Berkeley (UCB) Office of Technology Licensing has licensed a new microelectromechanical systems (MEMS) actuator design to a broad range of companies, including Honeywell, Toyota, Bosh and Discera.

“MEMS is a cutting-edge technology that uses the tools and techniques developed for the integrated circuit industry to build microscopic machines.

These machines are built on standard silicon wafers. Actuators are devices that convert an electrical control signal to a physical action.

The novel actuator arose from work done in the 1980s by Roger Howe, then a professor at UCB, and a graduate student, William Tang, as part of a larger interdisciplinary research project to create MEMS, which combines electronic circuit design with complementary metal-oxide-semiconductor (CMOS) fabrication technology. Berkeley researchers have been at the forefront of this investigation, and the Berkeley campus is the source of many MEMS inventions spearheading the commercialization of this technology.

The actuator invented by Howe and Tang resembles two tiny combs with their tines intertwined. One comb is fixed and the other pivots when a small voltage is applied, resulting in activation. While previous MEMS actuators were perpendicular to the CMOS chip, the novel actuator is fabricated lateral to the chip surface. This design enables reliable, precise MEMS actuation that is commercially feasible in high-volume, low-cost applications.

The advent of this MEMS actuator and the non-exclusive licensing of the associated patent rights have resulted in the proliferation of the technology in devices from disk drives to gyroscopes to network routers and optical switches.

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