BIOLOGICALLY-INSPIRED PIEZOELECTRIC GYROSCOPE

Tech ID: 17250 / UC Case 2003-048-0

ABSTRACT

Using micromachined gyroscopes to measure angular velocity is becoming increasingly common in applications ranging from ballistics and crash-testing to mobile micro-robotics. Although a variety of MEMS gyroscopes are commercially available, their dynamic range, power requirements and package size are sometimes not well-suited to the applications.

To address these problems, researchers at the University of California at Berkeley have developed a radically new type of angular rate sensor. Based on the biological mechanism of flying insects, this Berkeley biomimetic gyroscope uses piezoelectric actuators to measure angular velocity.

There are several advantages to using this biomimetic approach over MEMS-based designs. First, the biomimetic gyroscope has a much greater dynamic range. It can detect angular velocities from as low as tens of degrees per second to as high as hundreds of thousands of degrees per second -- three orders of magnitude higher than most MEMS gyroscopes. Second, in applications involving rapidly moving objects, this Berkeley gyroscope requires much less power than the MEMS alternatives.

APPLICATIONS

Ballistics

Guidance Systems

Crash Testing

Mobile Micro-Robitics

ADVANTAGES

Large dynamic range

Low power requirements

Optimized package

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	7,107,842	09/19/2006	2003-048

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OTHER INFORMATION

KEYWORDS

sensors, navigational, instrumentation

CATEGORIZED AS

» **Sensors & Instrumentation**

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