Introduction: Tracking the position of an object is an important engineering problem that finds many application areas including military, industrial, medical, and consumer applications. This problem is effectively solved with gyroscopes. This paper presents a piezoelectric gyroscope with a proof mass packed between piezoelectric slabs in all directions. Fig 1 shows our design of MEMS piezoelectric gyroscope.

Results: The deformation in the different piezoelectric slabs depends on angular displacement of the body, Eigen frequency analysis is done to inspect the deformation and potential generated in the piezoelectric slabs.

Computational Methods: When the body is oriented from its position the angular displacement is measured by comparing the force exerted on each piezoelectric slabs. The physics interfaces that we used are piezoelectric devices and solid mechanics.

Material applied for the proof mass | Max deformation | Potential generated
--- | --- | ---
Structural steel | 50x10^-7um | 0.018V
Platinum | 25x10^-6um | 0.083V

Conclusion: MEMS technology exploits the existing microelectronics infrastructure to create complex machines on a micrometer scale. Extensive applications for these devices are Tracking the position of an object, military, industrial, medical, consumer applications and perfect for gaming.

References: