

"MEMS Inertial Sensors: A Technology Overview"

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Gyroscopes and accelerometers have been deployed for marine and aerial navigation for a long time. Even so, the mass production and penetration of these inertial sensors into consumer, automotive, and industrial products have all taken place in recent years. This rapid proliferation was made possible through miniaturization and batch fabrication of these devices, thanks to microfabrication technology. Although, MEMS inertial sensors provide the level of functionality required by most consumer applications, they are yet to achieve performance levels necessary for inertial navigation and reduce in physical size and cost of fabrication through co-integration of multi-axis devices and implementation of real-time calibration schemes.

This tutorial will present an overview of the latest trends in Inertial MEMS technology. Approaches to realization of high performance inertial measurement units consisting of triaxial accelerometers and triaxial gyroscopes will be discussed. Various designs of inertial sensors including both accelerometers and gyroscopes will be presented, highlighting their fabrication technologies and packaging. Architectures to implement high dynamic range inertial sensors along with self calibration of these devices will be covered.



Mojtaba Hodjat-Shamami received the BEng degree from McMaster University, Hamilton, ON, in 2009, and the MS degree from Georgia Institute of Technology, Atlanta, GA, in 2011. He is currently working towards his PhD degree in the Integrated MEMS Laboratory at Georgia Tech and his research is mainly focused on the design of multi-degree-of-freedom MEMS inertial sensors. Mr. Hodjat-Shamami was the recipient of the Undergraduate Research Award from McMaster University, and the Outstanding Graduate Teaching Assistant Award from Georgia Tech.