

# **Abstract**

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## **Nonlinear Modeling of the Stochastic Errors of MEMS Inertial Sensors Utilized in Smart Phones**

A robust nonlinear modeling technique based on Fast Orthogonal Search (FOS) is introduced to remove MEMS-based inertial sensor stochastic errors inside smart mobile phones that are used for several purposes including location based services and device usage classification. The proposed method is applied to MEMS-based gyroscopes and accelerometers. Results show that the proposed method models low-cost MEMS sensors errors with no need for de-noising techniques and, using smaller model order and less computation, outperforms traditional methods by two orders of magnitude.