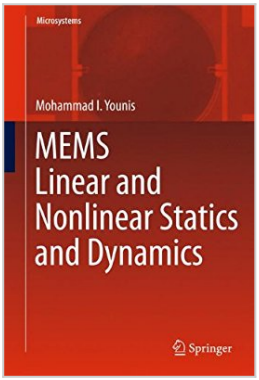

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By Mohammad I. Younis

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MEMS Linear and Nonlinear Statics and Dynamics presents the necessary analytical and computational tools for MEMS designers to model and simulate most known MEMS devices, structures, and phenomena. This book also provides an in-depth analysis and treatment of the most common static and dynamic phenomena in MEMS that are encountered by engineers. Coverage also includes nonlinear modeling approaches to modeling various MEMS phenomena of a nonlinear nature, such as those due to electrostatic forces, squeeze-film damping, and large deflection of structures. The book also:

- Includes examples of numerous MEMS devices and structures that require static or dynamic modeling
- Provides code for programs in Matlab, Mathematica, and ANSYS for simulating the behavior of MEMS structures
- Provides real world problems related to the dynamics of MEMS such as dynamics of electrostatically actuated devices, stiction and adhesion of microbeams due to electrostatic and capillary forces

MEMS Linear and Nonlinear Statics and Dynamics is an ideal volume for researchers and engineers working in MEMS design and fabrication.

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Editorial Review

From the Back Cover

MEMS Linear and Nonlinear Statics and Dynamics presents the necessary analytical and computational tools for MEMS designers to model and simulate most known MEMS devices, structures, and phenomena. This book also provides an in-depth analysis and treatment of the most common static and dynamic phenomena in MEMS that are encountered by engineers. Coverage also includes nonlinear modeling approaches to modeling various MEMS phenomena of a nonlinear nature, such as those due to electrostatic forces, squeeze-film damping, and large deflection of structures. The book also:

- Includes examples of numerous MEMS devices and structures that require static or dynamic modeling including accelerometers, gyroscopes, and Atomic Force Microscopes.
- Offers real world problems related to the dynamics of MEMS such as static and dynamic pull-in, buckling, and failure due to capillary forces.
- Presents in-depth treatment of the statics and dynamics of electrostatic MEMS including universal pull-in curves and natural frequencies of common microbeams, performance analysis of micromirrors and torsional actuators, nonlinear dynamics of MEMS resonators and associated phenomena, as well as design issues related to comb-drive actuators.
- Features detailed discussions of the effect of mechanical shock on microstructures.

MEMS Linear and Nonlinear Statics and Dynamics is an ideal volume for researchers and engineers working in MEMS design, modeling, and characterization.

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