Title:  
DESIGN AND SIMULATION of DRIVE AND READOUT CIRCUIT FOR MEMS VIBRATORY GYROSCOPE.

Abstract:  
A gyroscope is a sensor that measure the velocity or amount of the rotation angle. In this thesis, issues related to the design and simulation of readout circuit for a micro-electro-mechanical angular velocity sensor are studied. The work focuses on a circuit system based on a silicon vibratory microgyroscope which operates in the close-loop configuration mode for primary resonator (drive) and with an open-loop configuration of the secondary (sense) resonator. Furthermore, the gyroscope employs electrostatic excitation and capacitive detection. A T-network TIA is proposed as the front-end for resonant capacitive detection. A T-network TIA is proposed as the front-end for resonant capacitive detection. The implemented T-network TIA provides gains of 130db, has a measured capacitive resolution of 18aF/√Hz at 10KHz. For matching the frequency of drive and sense mode of gyroscope and also for fixing the amplitude of drive signal is used from phased locked loop and automatic level control circuits respectively. In the measuring part, for detection of rate and quadrature signal is used from multiplier (mixer) circuits.

Keywords:  
Sensor, Gyroscope, Circuit, Coriolis, MEMS, Signal.