

Simulation of MEMS Based Pressure Sensor for Diagnosing Sleep Disorders

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Abstract

Sleep apnea is a type of sleep disorder characterized by pauses in breathing or instances of shallow or infrequent breathing during sleep. There is a need to diagnose sleep apnea since it leads to fluctuations in the oxygen level that in turn affect the heart rate and blood pressure. In order to detect this disorder, a Micro Electro Mechanical System (MEMS) based piezoelectric pressure sensor was designed and simulated the results using COMSOL Multiphysics® software. In this work, Zinc Oxide (ZnO) nanowire is chosen as a sensing material for its excellent piezoelectric and semi-conducting properties. The force/pressure generated during sleep is converted to electrical output via this piezoelectric material, which helps in diagnosing sleep apnea in children.