

MODELLING OF SMART THIN FILM THERMAL-CONDUCTIVITY HUMIDITY SENSOR USING ANN

Karim FERROUDJI, Nabil Benoudjit, and Fayçal Medjili

Abstract : The aim of this paper is to achieve a modeling design of a smart thermal-conductivity based humidity sensor (THS) using neuronal networks. Since the variation in temperature can strongly affect the sensitivity of the humidity sensor leading to a nonlinear response of the applied humidity, our mission is twofold: (i) accurately express the sensor using Radial Basis Function Neuronal Network (RBFNN); (ii) propose an element of correction whose goal is to correct the nonlinear response and eliminate the temperature effect. The paper proposes a smart sensor which incorporates Artificial Intelligence into the thermal-conductivity based humidity sensor, it exploits the RBFNN capability to provide compensation and self-calibration which is verified by simulations results.

Keywords : Humidity Sensor, Thermal-conductivity, Artificial intelligence, Neuronal Network, ANN modeling, Corrector model, RBFNN