

## 基于复合RBFNN的数字温度传感器误差补偿方法

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摘要：

数字温度传感器存在零点误差与非线性误差，需进行误差补偿。提出了一种复合径向基函数神经网络（CRBFNN）的数字温度传感器误差补偿方法：首先根据数字温度传感器的误差特征，构造两个相互独立的子RBFNN网络，获得两个独立的冗余补偿值；然后根据特征阈值、数字温度传感器的输出估计器和权值调节器，获得复合RBFNN输出融合权值，从而完成数字温度传感器的误差补偿，获得最终的测温结果。通过与Bagging算法、单RBFNN方法的比较仿真实验表明，这种基于CRBFNN补偿方法的性能最佳，采用这种方法补偿后的数字温度传感器误差较补偿前减少了两个数量级，大大提高了数字温度传感器的测量准确度。

关键词：数字温度传感器，误差补偿，复合径向基函数神经网络

## Error Compensation of Digital Temperature Sensor Based on Complex RBF Neural Network

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**Abstract:**

An error compensation method is proposed for digital temperature sensor's zero error and nonlinear error based on complex radial basis function neural network (CRBFNN). Two independent member networks are founded according the digital temperature sensor's error character and two redundant compensated temperature data are gotten. The characteristic threshold, the estimator of digital temperature sensor's output and the adjuster of the weight are used to obtain the output weight of CRBFNN, and then the final compensated temperature result from digital temperature sensor is obtained. Using complex RBFNN, Bagging algorithm and single RBFNN to compensate the digital temperature sensor, the experimental results show that the performance of the sensor with CRBFNN method is best, and its error decreases two orders of magnitude less than that of no compensation.

**Keywords:** digital temperature sensor, error compensation, complex radial basis function neural network

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