

## **Applications of Artificial Neural Networks in Engine Cooling System**

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### **ABSTRACT**

Artificial neural network (ANN) is a powerful method for nonlinear regression, classification, object detection, and clustering and is widely used in thermal analysis of the cooling system. Cooling system is an invaluable part of removing waste heat from an internal combustion engine. A few decades ago, the engine cooling system became more advanced for developing a higher-performance engine. To enhance the engine cooling system, ANN is a promising method. In this context, this paper presents a brief survey, which reviews the ANN-based engine cooling system. For this purpose, we describe the different types of ANNs which are pertinent to engine cooling systems. Different evaluation metrics which are used to evaluate the performance of ANN in engine cooling systems, as well as the activation functions and modelling of ANN, are also introduced in this paper. Furthermore, the basics of engine cooling systems and different applications of ANN in cooling systems are described briefly. Finally, some limitations of ANN and future research scope are also presented here.

### **KEYWORDS**

ANNs; Artificial neural; Engine cooling system; FFNNs; Network; RBFNNs; RNNs

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