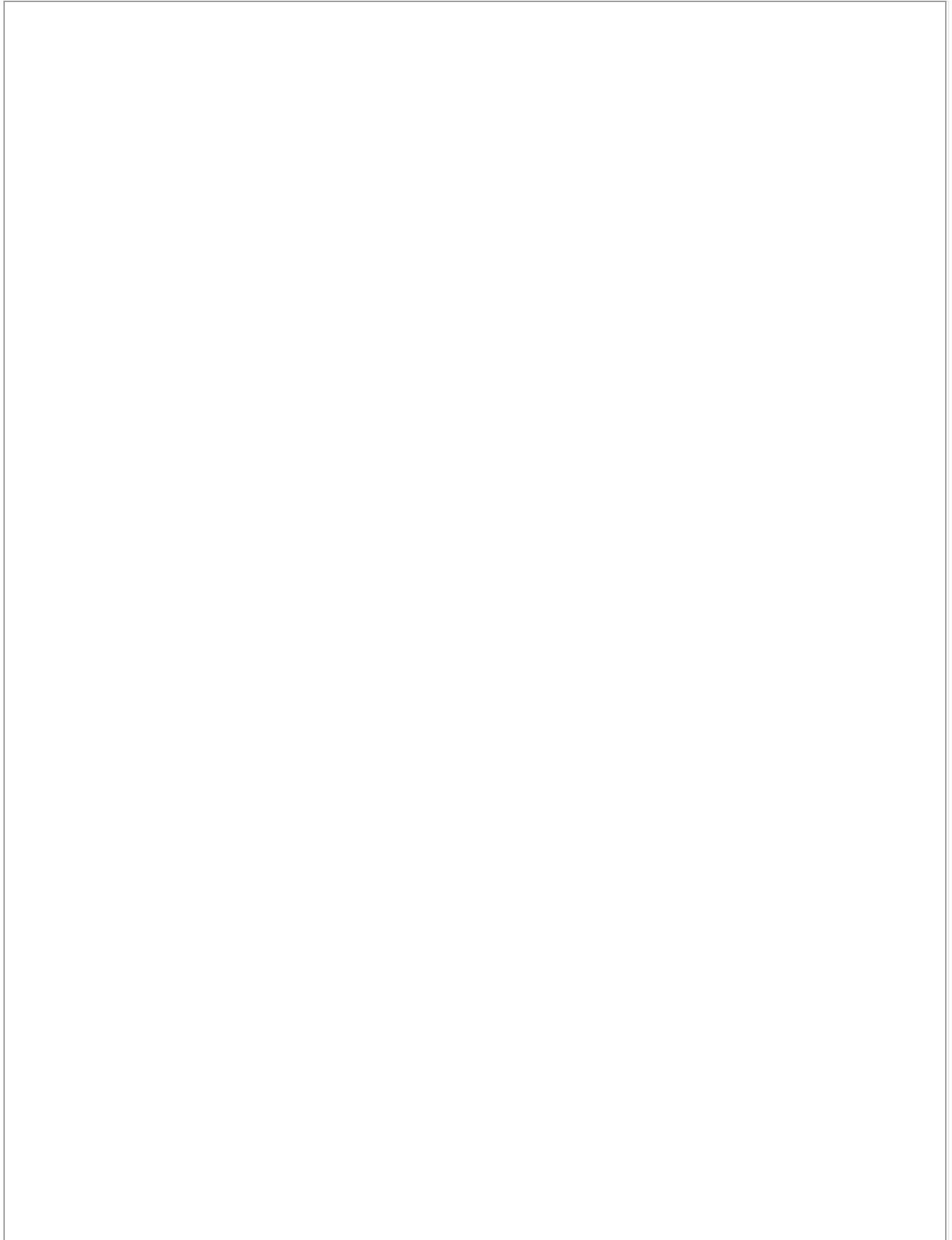# Scopus

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Long Short-Term Memory Neural Network Model for the Control of Temperature in A Multi-Circuit Air Conditioning System

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Abstract

Temperature control is important in energy management of buildings. Air conditioning system contributes a high percentage of the total energy consumption, the compressor, which is a major component of the Air conditioning system, utilizes up to 90% of the energy. This can drastically be reduced by varying the frequency of the compressor with respect to the required indoor temperature, as such, reducing the overall energy usage of the air conditioning system. The combination of a well-tuned controller and variable frequency drive can be used to achieve this. It is important to develop a good model which can be used to design the controller. Although there are published research works in the development of models for the control of air conditioning systems, there seems to be a lack of study in the area of multi-circuit centralized air conditioning system. In this study, two models were developed using Long Short Term Memory Neural Network and Recurrent Neural Network, utilizing compressor speed and indoor air temperature of a multi-circuit water cooled packaged unit as input and output respectively. Comparing the two models, results shows that the Long Short-Term Memory Neural Network model performed better across evaluation metrics such as R-squared, Mean Squared Error and Mean Absolute Error, with the value of 0.9638, 0.0049, and 0.0190 respectively. © 2022, Penerbit Akademia Baru. All rights reserved.

Author Keywords
Multi-Circuit Air Conditioning System; Neural Network; Temperature control

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