# Article information:

Combining CFD and artificial neural network techniques to predict the thermal performance of all-glass straight evacuated tube solar collector - ScienceDirect  
<https://www.sciencedirect.com/science/article/pii/S0360544220328206?via%3Dihub>

# Article summary:

1. This article examines the thermal performance of a novel all-glass straight-through evacuated tube collector.

2. A mathematical model was developed and incorporated into CFD software for numerical performance simulation.

3. Artificial neural networks (ANN) models were used to improve the prediction accuracy of the collector, with convolutional neural network (CNN) proving to be the best ANN model in terms of prediction accuracy.

# Article rating:

Appears well balanced: The article presents the information in a reliable and balanced way, without biases and prejudices. The claims made in the article are well supported and, where applicable, all sides of the argument are given opportunity to present their point of view. The article appears trustworthy and reliable.

# Article analysis:

This article is generally reliable and trustworthy, as it provides a comprehensive overview of the research conducted on the thermal performance modelling and prediction of a novel all-glass straight-through evacuated tube collector. The article is well written and provides detailed information on the mathematical model developed, as well as on the different artificial neural network (ANN) models considered for improving the prediction accuracy of the collector. Furthermore, it presents a comprehensive experimental dataset with more than 200 samples employed for testing of the models, which further adds to its reliability.

The article does not appear to have any potential biases or one-sided reporting, as it presents both sides equally and does not promote any particular point of view or opinion. It also does not contain any unsupported claims or missing points of consideration, as all claims are backed up by evidence from experiments and simulations conducted by researchers in this field. Additionally, there are no unexplored counterarguments or missing evidence for any claims made in this article.

The only potential issue with this article is that it does not mention any possible risks associated with using artificial neural networks (ANNs) for predicting thermal performance in solar collectors. However, this is likely due to space constraints rather than an intentional omission by authors, as such risks would be outside the scope of this particular paper.

# Topics for further research:

* Artificial Neural Network (ANN) risks
* Solar collector thermal performance prediction
* Evacuated tube collector modelling
* All-glass straight-through collector simulation
* Mathematical modelling of solar collectors
* Experimental dataset for solar collector testing

# Report location:

<https://www.fullpicture.app/item/3da7c54c4130ed5a2cf8c14f971166a6>