

PROF. DR. IR. JEFREY I. KINDANGEN, DEA.

NATURAL VENTILATION

**From Computational Fluid Dynamics
To Artificial Neural Networks
For Thermal Comfort**

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***Natural Ventilation, From Computational Fluid Dynamics,
To Artificial Neural Networks, For Thermal Comfort***

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Manado, February 2008

Prof. Jeffrey I. Kindangen

PREFACE

Increasing demands for energy saving and a higher degree of comfort in rooms compels architects to use more sophisticated analysis methods.

This book will describe the cases for analysis of natural ventilation performance by making use of Computational Fluid Dynamics (CFD) codes and Artificial Neural Networks.

Firstly, this study will present the investigation of natural ventilation with Computational Fluid Dynamics. Secondly, it will attempt to formally investigate the effects of roof shapes on indoor airflow pattern. Thirdly, it will be presented the prediction of architectural element effects on interior air motion using Artificial Neural Networks. Fourthly, Artificial Neural Networks will be expanded to cover more problems such as the prediction of interior velocity coefficients. Finally, it will be studied the applicability of windows and roof configurations to comfort ventilation.

From the analysis in this study it can be seen that the use of some sophisticated analysis methods has many advantages, such as time saving, that has been shown to be a very promising technique and opens up an interesting field of investigation which they provide reliable results.

It is strongly suggested that the future work on this domain is needed to address the thermal comfort assessment.

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