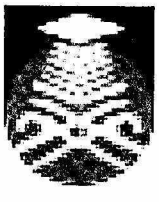
Artificial Neural Network-Fast Evolutionary Programming (FEP) Technique for Lightning Prediction

Thesis presented in partial fulfillment of the requirement for

Bachelor of Electrical Engineering (Hons.)

UNIVERSITI TEKNOLOGI MARA



ROYMELVIN RICKY
Faculty of Electrical Engineering
UNIVERSITI TEKNOLOGI MARA
40450 Shah Alam, Selangor, Malaysia
Nov 2009

ABSTRACT

Lightning is a natural phenomenon that is common all over the world. The occurrence of these phenomena is renowned for its effect. Over the years, various lightning prediction system have been developed to predict lightning. In this paper, Artificial Neural Network (ANN) with Evolutionary Programming (EP) is proposed to be applied in the lightning prediction system based on historical lightning and meteorological data. The Fast EP optimization technique is implemented in order to optimize the values of learning rate and momentum constant automatically with less computation time. The values are used in ANN architecture for the ANN to perform efficiently in predicting the lightning occurrence. As a result, this technique indicates that less time is required to determine the best ANN parameter automatically as well as to get the best ANN architecture compared to the heuristic method. It has also improved the ability of the system to predict lightning accurately

ACKNOWLEDGEMENT

First and foremost, I would like to express my appreciation to Cik Dalina Johari as my final year project supervisor for her guidance and support throughout this project. A special thanks to Cik Dalina for her patience, assistance and cooperation in the preparation of this thesis.

I am also indebted to all of my friends around me for their assistance and guidance in producing this work. I greatly appreciate the time they spent with me and I have learned something from each of them.

Last, but certainly not least, the continual encouragement and support of my father, and my mother, is deeply and sincerely appreciated and for those who have helped, I express my sincere "Thanks!".

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