

SYSTEM IDENTIFICATION OF NONLINEAR AUTOREGRESSIVE MODELS IN MONITORING DENGUE INFECTION

#H. Abdul Rahim¹, F. Ibrahim² and M. N. Taib³

¹Department of Control and Instrumentation Engineering, Faculty of Electrical Engineering, Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor, Malaysia.

²Department of Biomedical Engineering, Faculty of Engineering, University of Malaya, 50603 Kuala Lumpur, Malaysia.

³Faculty of Electrical Engineering, Universiti Teknologi Mara, 40450 Shah Alam, Selangor, Malaysia.

#Emails: herlina@fke.utm.my

Abstract-This paper proposes system identification on application of nonlinear AR (NAR) based on Artificial Neural Network (ANN) for monitor of dengue infections. In building the model, three selection criteria, i.e. the final prediction error (FPE), Akaike's Information Criteria (AIC), and Lipschitz number were used. Each of the models is divided into two approaches, which are unregularized approach and regularized approach. The findings indicate that NARMAX model with regularized approach yields better accuracy by 80.60%.

The best parameters' settings for this thesis can be found using the Lipschitz number criterion for the model order selection with artificial neural network structure of 4 trained using the Levenberg Marquardt algorithm.

Index terms: dengue fever, NAR model, AIC, Lipschitz, FPE, ROC and AUC.