

DESIGN OF ANFIS NETWORKS USING HYBRID GENETIC AND SVD METHODS FOR MODELING AND PREDICTION OF RUBBER ENGINE MOUNT STIFFNESS

J. MARZBANRAD^{*} and A. JAMALI

Automotive Engineering Department, Iran University of Science & Technology, Narmak 16846-13114, Tehran, Iran

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ABSTRACT—Genetic Algorithm (GA) and Singular Value Decomposition (SVD) are deployed for optimal design of both the Gaussian membership functions of antecedents and the vector of linear coefficients of consequents, respectively, of ANFIS networks. These networks are used for stiffness modelling and prediction of rubber engine mounts. The aim of such modelling is to show how the stiffness of an engine mount changes with variations in geometric parameters. It is demonstrated that SVD can be optimally used to find the vector of linear coefficients of conclusion parts using ANFIS (Adaptive Neuro-Fuzzy Inference Systems) models. In addition, the Gaussian membership functions in premise parts can be determined using a GA. In this study, the stiffness training data of 36 different bush type engine mounts were obtained using the finite element analysis (FEA).

KEY WORDS : ANFIS (Adaptive Neuro-Fuzzy Inference Systems), Engine mount; Genetic algorithms (GAs), SVD (Singular Value Decomposition), FEA (Finite Element Analysis)