Intelligent air-cushion tracked vehicle performance investigation: neural-networks

Altab Hossain*
Faculty of Engineering,
Department of Engineering Design and Manufacture,
University of Malaya (UM),
Kuala Lumpur 50603, Malaysia
Fax: +6-03-79675330
E-mail: altab76@gmail.com
*Corresponding author

Ataur Rahman and A.K.M. Mohiuddin
Faculty of Engineering,
Department of Mechanical Engineering,
International Islamic University Malaysia (IIUM),
Kuala Lumpur 53100, Malaysia
E-mail: arat@iium.edu.my
E-mail: mohiuddin@iium.edu.my

S. Ramesh
Faculty of Engineering,
Department of Engineering Design and Manufacture,
University of Malaya (UM),
Kuala Lumpur 50603, Malaysia
E-mail: ramesh79@um.edu.my

Abstract: Intelligent Air-Cushion Tracked Vehicle (IACTV) is intended as an alternative to conventional off-road vehicles, which are driven by track system and air-cushion system. To make IACTV as efficient as possible, proper investigation of vehicle performance is essential. However, most relevant factors that affect the competitive efficiency of the air-cushion tracked vehicle are the tractive effort, motion resistance and power consumption. Therefore, an Artificial Neural-Network (ANN) model is proposed to investigate the vehicle performance. Cushion Clearance Height (CH), and Air-Cushion Pressure (CP) are used at the input layers while Power Consumption (PC), Tractive Effort (TE) and Motion Resistance (MR) are used at the output layers. Experiments are carried out in the field to investigate the vehicle performance and compared with the results obtained from ANN.

Keywords: ANN; artificial neural network; CH; cushion clearance height; PC; power consumption; TE; tractive effort; MR; motion resistance.