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Modelling vehicle fuel consumption utilising artificial neural networks

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The main source of energy used in this modern age is fossil fuels. There is a myriad of problems that come with the use of fossil fuels, out of which the issues with the greatest impact are its scarcity and the cost it imposes on the planet. Fossil fuels are the only plausible option for many vital functions and processes; the most important of these is transportation. Thus, using this source of energy wisely and as efficiently as possible is a must. The aim of this work was to explore utilising mathematical modelling and artificial intelligence techniques to enhance fuel consumption in passenger cars by focusing on the speed at which cars are driven. An artificial neural network with an error less than 0.05 was developed to be applied practically as to predict the rate of fuel consumption in vehicles.

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Modeling mechanical properties of FSW thick pure copper plates and optimizing it utilizing artificial intelligence techniques

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Friction stir welding(FSW) is an innovative solid state joining technique and has been employed in aerospace, rail, automotive and marine industries for joining aluminum, magnesium, zinc and copper alloys. In this process, parameters play a major role in deciding the weld quality these parameters. Using predictive modelling for mechanical properties of FSW not only reduce experiments but also is created standard model for predict outcomes. Therefore, this paper is undertaken to develop a model to predict the microstructure and mechanical properties of FSW. The proposed model is based on Ring Probabilistic logic Neural Network (RPLNN) and optimize it utilizing Genetic Algorithms (GA). The simulation results show that performance of the RPLNN algorithm with utilizing Genetic Algorithm optimizing technique compared to real data is reliable to deal with function approximation problems, and it is capable of achieving a solution in few convergence time steps with powerful and reliable results.

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