

عنوان مقاله:

Application of Wavelet Neural Network in Forward Kinematics Solution of 6-RSU Co-axial Parallel Mechanism Based on Final Prediction Error

محل انتشار:

ماهنامه بین المللی مهندسی، دوره 31، شماره 8 (سال: 1397)

تعداد صفحات اصل مقاله: 9

نویسنده:

Arash Rahmani - Mechanical Engineering, Urmia University of Technology

خلاصه مقاله:

Application of artificial neural network (ANN) in forward kinematic solution (FKS) of a novel co-axial parallel mechanism with six degrees of freedom (6-DOF) is addressed in Current work. The mechanism is known as six revolute-spherical-universal (RSU) and constructed by 6-RSU co-axial kinematic chains in parallel form. First, applying geometrical analysis and vectorial principles the kinematic model is extracted and inverse kinematics solution is done. Due to highly nonlinear characteristic of the model, forward kinematic solution for 6-RSU is so complicated. Therefore, ANN based on wavelet analysis, as a powerful solution, is designed and applied to solve FK problem. The minimum prediction risk principle with using final prediction error (FPE) is applied to find the best and optimum topology of our proposed neural network (WNN) in this paper. Furthermore, proposed wavelet WNN is developed to approximate the specific reference trajectories for manipulated platform of mechanism and the results are obtained. Comparing the extracted results by WNN with closed form solution (CFS) demonstrates the accuracy and efficiency of the proposed WNN.

کلمات کلیدی:

Wavelet Neural Network, kinematic analysis, 6, RSU Parallel Mechanism, Final Prediction Error

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/963104>

