

عنوان مقاله:

A Heuristic Approach for 3D-Optimization of 3-Stage Gear Train Using PSO

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خلاصه مقاله:

Optimization the volume/weight of the gear train is more important for industries and researchers. In this paper using particle swarm optimization algorithm a general gear train is optimized. The main idea is to optimum the volume/weight of the gearbox in 3 directions. So, the optimization process based on PSO algorithm occurs along height, length and width of the gearbox to achieve the smallest possible gearbox. The constraints divided into three types of constraints: geometrical, design and control constraints. The optimization process presented for two and three stage gear trains and by choosing different values for the gear ratio, input power and hardness of gears the practical graphs for value of the optimum weight/volume and all the necessary design parameters of gearbox such as number of stages, position and modulus of gears, face width of gears and diameter of shafts are presented. The results are validated by comparing to the results reported in the previous publication.

کلمات کلیدی:

Optimization layout gears, Weight/volume optimization, Particle Swarm Optimization (PSO), Gear train

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