

FRACTIONAL ORDER PID CONTROLLER DESIGN FOR MIMO SYSTEM USING HEURISTIC ALGORITHMS

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In this work, an effort is carried out to scheme and execute the fractional order PID controllers for Multi Input Multi Output (MIMO) process by means of various heuristic procedures. The comparison is made between Firefly Algorithm (FA) and Particle Swarm Optimization algorithm (PSO) and then with Bacterial Foraging Optimization algorithm (BFO). The factor of the effective problem is allocated as two operators (K_p , K_i). In the proposed work, separate cost function is formulated for integral PID controller and tuned to fractional order PID controller. The projected approach is examined on the recognized MIMO Benchmark system, such as Vinate and Luyben (VL) model. A detailed relative analysis is presented between the FA, PSO and BFO and the productiveness of the suggested scheme has been endorsed using the well-known performance measure standards, such as M_p , t_s , ISE and IAE. This examine confirms that, the FO-PID controller design concept offers better results when paralleled to the common PID controller on the accounted MIMO models and also projects that Fractional Order PID controller is highly effective on Firefly Algorithm.