

Grey Wolf Optimization of Fractional PID controller in Gas Metal Arc Welding process

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Abstract : Gas metal arc welding (GMAW) plays the great importance in the welding industry. This paper presents a grey wolf optimization (GWO) of fractional PID controller in order to optimize arc length and arc current in the GMAW process. Firstly, fractional PID control of gas metal arc welding system is proposed, wherein the arc length and current of welding process are controlled, then the Grey Wolf Optimization is introduced to solve multi-objective functions of GMAW in order to find the optimal parameters of fractional PID controller. The obtained results are compared with those given by fractional PID controller in which our proposed method can ensure a better dynamic behavior of the GMAW process.

Keywords : GMAW, MIMO system, GWO, Fractional PID controller