



SOFT SENSOR BASED ON A PSO-BP NEURAL NETWORK FOR A TITANIUM BILLET FURNACE-TEMPERATURE

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ABSTRACT—This paper builds a soft sensor model based on a PSO-BP neural network for titanium billet heating furnace-temperature. An improved particle swarm optimization algorithm is proposed. This algorithm is used to optimize the initial weights of the neural network, which can overcome the disadvantages of the random initial weights of the conventional BP neural networks. The proposed algorithm is based on an adaptive particle swarm optimization method with a jump-factor and a jump-strategy added on the position states, and can improve the ability of the global searching. The results of the simulation based on industrial data show that the precision of the sensor by using the proposed model meets the practical requirements.

Key Words: Particle Swarm Optimization, neural network soft sensor. Titanium Billet heating furnace, furnace temperature,