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عنوان مقاله:

ADAPTIVE CONTROL OF GAS METAL ARC WELDING BY NEURAL NETWORK MODELING

محل انتشار:

پانزدهمین کنفرانس سالانه مهندسی مکانیک (سال: 1386)

تعداد صفحات اصل مقاله: 7

نویسندگان:

Khalaf - *Assistant professor, Fars science and Technology Park shiraz, Iran*

Maneshian - *Msc.student, Shiraz university shiraz, Iran*

خلاصه مقاله:

Real time control of penetration in the Gas Metal Are Welding (GMAW) process by sensing condition at the top surface of the joint continues to be a major area of interest for automation of the process. This paper describe the development of Artificial Neural Network (ANN)based process control models which will enable an acceptable weld to be achieved through monitoring the temperature at a point on the joint surface, and controlling adjustable input process variables. Results of experimentation and modeling studies are described. These establish the relationship between welding input variable and the resulting output of temperature distribution, and between the output temperature distribution and corresponding achieved weld quality criteria. Fixed input variables include, plate thickness, joint type, root gap, root face thickness, bevel angles, etc.. Adjustable input variables include, current, voltage, torch speed, gas flow rate torch angle, stand off, weaving, etc.. The results of experiments have been used as training and validation data for ANN models which are evalu ated on a simulation package. Data from the experiments is obtained using infrared spectrography to obtain 2D temperature distribution. The application potential for control using these models is significant since unlike many other top surface monitoring methods, it does not require sensing of the highly transient weld pool shape or surface

کلمات کلیدی:

Adaptive control - Gas Metal Arc Welding- Neural Network

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