

A vision system for the automatic welding of thin stainless steel plates

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A VISION SYSTEM FOR THE AUTOMATIC WELDING OF THIN STAINLESS STEEL PLATES

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ABSTRACT

A manufacturer, intending to automate the TIG welding of thin sheet stainless steel products, turned to our institute for assistance in determining an appropriate solution.

The operation to be automated was welding the cylindrical walls of containers to their pre-formed pan-like bases by a circumferential butt weld seam. In the present situation this is done by an operator who watches the process through a dark glass and manually adjusts the position of the welding electrode while the workpiece is rotated by a manipulator. The container diameters are in the range of a few hundred millimeters, the wall thickness generally being 0,8 mm.

In considering automation, the objective was to eliminate monotonous and eye-straining work, to ensure a more constant weld quality, and to achieve a higher productivity.

Although the problem could have been solved by employing one of the commercially available specialized seam detection sensors, preference was given to investigating the use of a vision system. Firstly, such a system would allow an operator to check the process on a monitor screen, secondly, it is expected to be more flexible in its adaptation to future needs than single-purpose sensors with dedicated electronics would be.

This paper describes the set-up and components used to obtain a suitable image in the presence of the arc, explains the method developed for extracting the torch and seam positions from the image in real time, and, because the investigation was carried out on an image processor more powerful than the production system would need, gives an estimation of the computing facility actually required and the price tag involved.

A video-tape recording of actual welding process images with a presentation of the processing performed on these images and a visualisation in real time of the accuracy and reliability of the tracking command signal has been prepared.

References

Baxes, G.A.; Vision and the computer: an overview. Robotics Age, March 1985, pp. 12...19.

Boderie, E.E.M.; Automated welding of thin plates by means of passive radiation sensors and electronic image processing. M.Sc. thesis, Eindhoven University of Technology, Dept. of Elec. Engg., Eindhoven, Aug. 1986.