

# **METHOD AND SYSTEM FOR ROBOTIC MULTI-PASS WELDING FOR FILLING COMPLEX GEOMETRY USING WELD PROFILE CONTROL WITH DATA- DRIVEN FAST INPUT ALLOCATION**

## **ABSTRACT**

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This disclosure relates to robotic welding for thick and complex weld geometry. To achieve good weld quality, desired welding profile and appropriate welding inputs are both required. In this disclosure, a welding profile control with data driven fast input allocation (PC-FIA) algorithm is proposed for robotic multi-pass welding on a complex weld geometry, namely,  
10 pipe-to-pipe joint. The  $H_{\infty}$  feedforward control algorithm is used for the welding profile control. In addition, the allocation of welding inputs including torch traveling speed and weaving parameters are formulated as a maximum – minimum problem based on the identified weld input constraint using a data-driven approach.

15 (Fig. 8)