

Resistance spot welding in automation and robotics

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Resistance spot welding is an important technique often used in joining thin work pieces in automobile, aerospace and packaging industries, etc. This presentation theoretically and quantitatively investigates and interprets processes by realistically accounting for transient magneto-fluid mechanics, heat and species transport and bulk resistance in work piece and film and constriction resistances at contact interfaces. Since temperature gradient and solidification rate are found, the computed morphological parameter which is the ratio between temperature gradient and solidification rate shows that the effects of electrode geometries and material properties on growth of microstructures of the weld nugget can be interpreted, predicted and controlled.

Biography

Peng-Sheng Wei has received his PhD in Mechanical Engineering Department at University of California, Davis. He is presently a Professor in the Department of Mechanical and Electro-Mechanical Engineering of National Sun Yat-Sen University (NSYSU), Kaohsiung, Taiwan. He has contributed to advancing the understanding of and to the applications of electron and laser beam, plasma and resistance welding through theoretical analyses coupled with verification experiments. He has published more than 80 SCI journal papers and is a Fellow of AWS and ASME. He has also received the Outstanding Research Achievement Awards from both the National Science Council (NSC) and NSYSU, the Outstanding Scholar Research Project Winner Award from NSC, the Adams Memorial Membership Award, the Warren F. Savage Memorial Award and the William Irrgang Memorial Award from American Welding Society (AWS). He has been the Xi-Wan Chair Professor of NSYSU and Invited Distinguished Professor in the Beijing University of Technology, China.

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