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Automated control of welding penetration based on audio sensing technology

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Graphical abstract

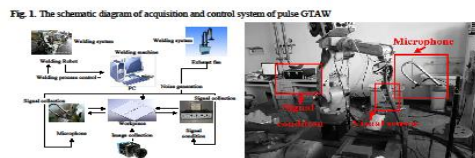


Fig. 2 The layout of audio sensing sensor

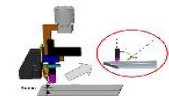


Fig. 3 The classification of three penetration state



Fig. 4 The original audible sound of welding process

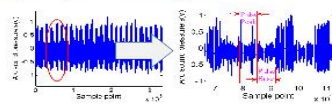


Fig. 5 The original audible sound of different penetration state

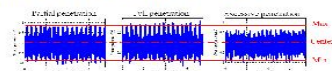


Fig. 6 The process of wavelet packet de-noising

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