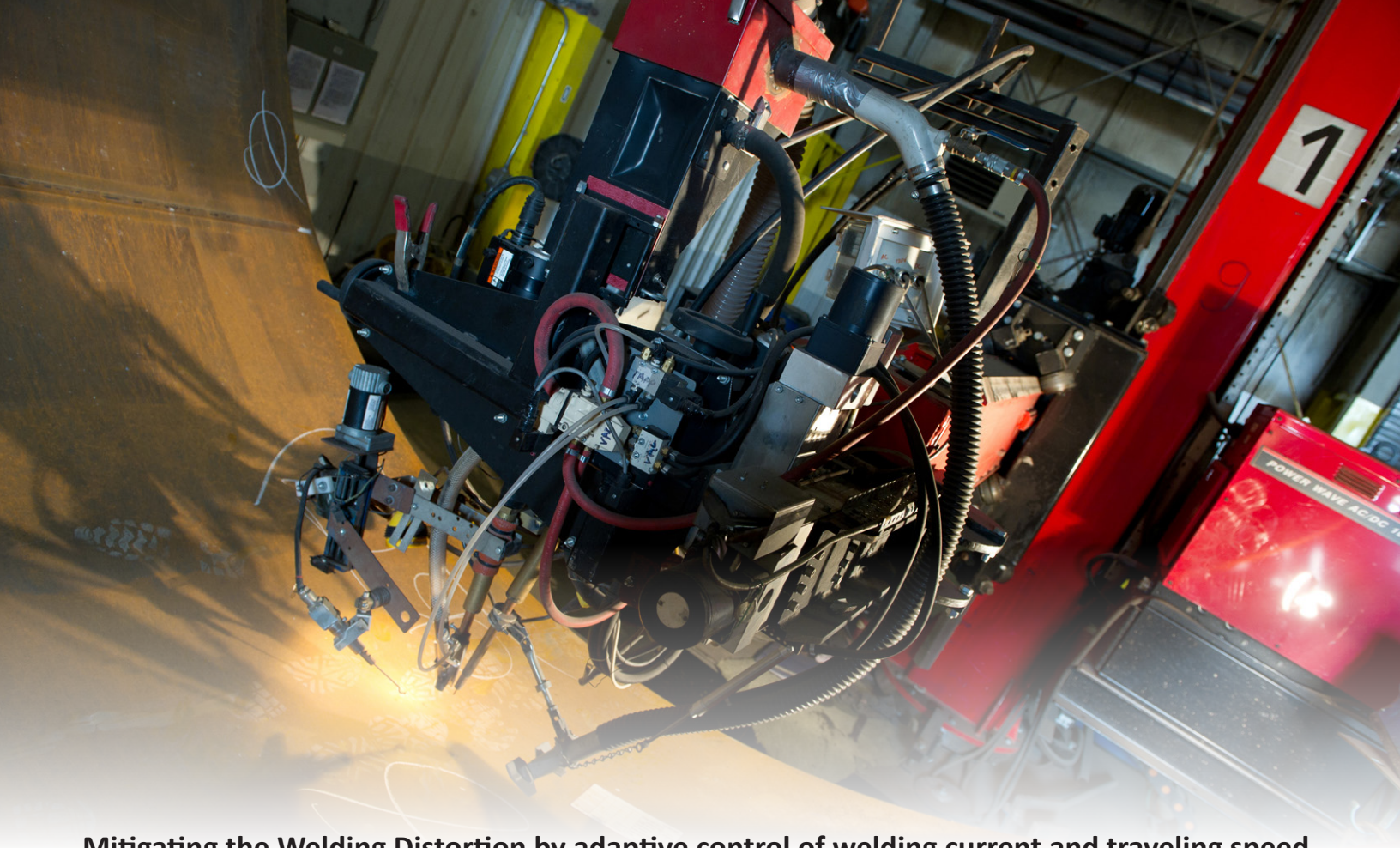

Mitigating the Welding Distortion by adaptive control of welding current and traveling speed

The use of welding robots for different applications has increased dramatically, from high-end applications to routing fabrications. Current robots are fast, efficient, and deterministic, and they are able to match the skill of human welders; however, they are limited by the capacity of humans to program them. Advances in computer technology provide a platform for performing complex algorithms much more efficiently than humans can react. Want to learn more? Check out Mahyar Asadi's presentation at the 2013 CanWeld Conference brought to you by the Canadian Welding Association.

Who is Mahyar Asadi?

Mahyar Asadi received his engineering degree in Material Science and Engineering (1999), and his Master's degree in Material Science and Engineering majoring in Welding (2001). He started his career in automotive industry's inspection and quality control including a promotion to manager of engineering department.

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Mitigating the Welding Distortion by Adaptive Control of Welding Current and Traveling Speed

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Abstract:

The use of welding robots for different applications has increased dramatically, from high-end applications to routing fabrications. Current robots are fast, efficient, and deterministic, and they are able to match the skill of human welders; however, they are limited by the capacity of humans to program them. Advances in computer technology provide a platform for performing complex algorithms much more efficiently than humans can react. A recent work of ours has been to simulate the use of these advanced methods, i.e., adaptive predictive control of welding current and traveling speed during welding, in order to mitigate the final distortion without the use of additional hardware such as fixtures, clamps, tack welds and so on. This simulation helps us to understand and optimize welding behaviour, but it becomes of practical use when validated empirically. The present work implements this advanced method by applying an optimized, varying welding current and traveling speed on an edge-welded bar of Aluminium 5052-H32. A comparison is made between the final welding distortion with the new method, versus the regular method at constant welding current and traveling speed. The simulation was conducted using the leading software of this field, and the transient distortion was measured by state-of-the-art 3D photogrammetry cameras. The tests were performed by the latest advanced welding robot, equipment and consumables at Canada's largest welding technology center.