

Remote Climbing Robot for Automated Welding Processes

Cost savings of 50-70% per weld job with a substantial reduction in set-up and in-process time

Significantly advancing automation in the shipbuilding process, the project team has developed a mobile, autonomous, robotic welding platform that has the potential to replace fixed-track-based devices resulting in a substantial savings in time, set-up requirements, safety and overall cost in naval ship construction (50-70% cost savings per job for typical erection joint welds).

Leveraging technology originally developed for remote inspections in the coal-fired electric power industry, the project team enhanced their mobile platform with a non-contact weld seam tracking system linked to a navigation and welding control algorithm. Further equipped with an industry-standard weld torch and wire feed, the platform is capable of near autonomous welding in almost any direction – vertical, horizontal or inverted.

The current version of the robotic welding platform was achieved using feedback from the shipbuilding and welding industry and underwent field testing at Bath Iron Works.



Objective

To continue development of a proven climbing robot technology by developing and integrating a non-contact weld-seam tracking and feature extraction sensor system coupled with a novel navigation and welding control algorithm.

Performing Activities

Robotic Technologies of Tennessee, Bath Iron Works, Tennessee Technological University

Key Deliverables

- Requirements for Weld Sensor / Torch Manipulator and Navigation and Control Strategy
- Unit Testing and Manuals Complete
- System Integrated and Tested

Point of Contact

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NSRP ASE INVESTMENT: \$126K

