Roof Deck Welding Assist Machine

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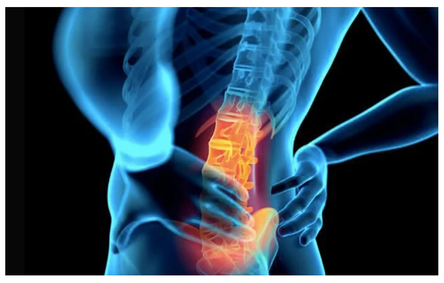
Problem Statement

Current roof deck welding requires workers to bend over at the hip to perform each weld. Constant bending at the waist leads to workers developing chronic back pain. Current OSHA recommendations to alleviate back pain are to minimize the bending required and to periodically stretch.

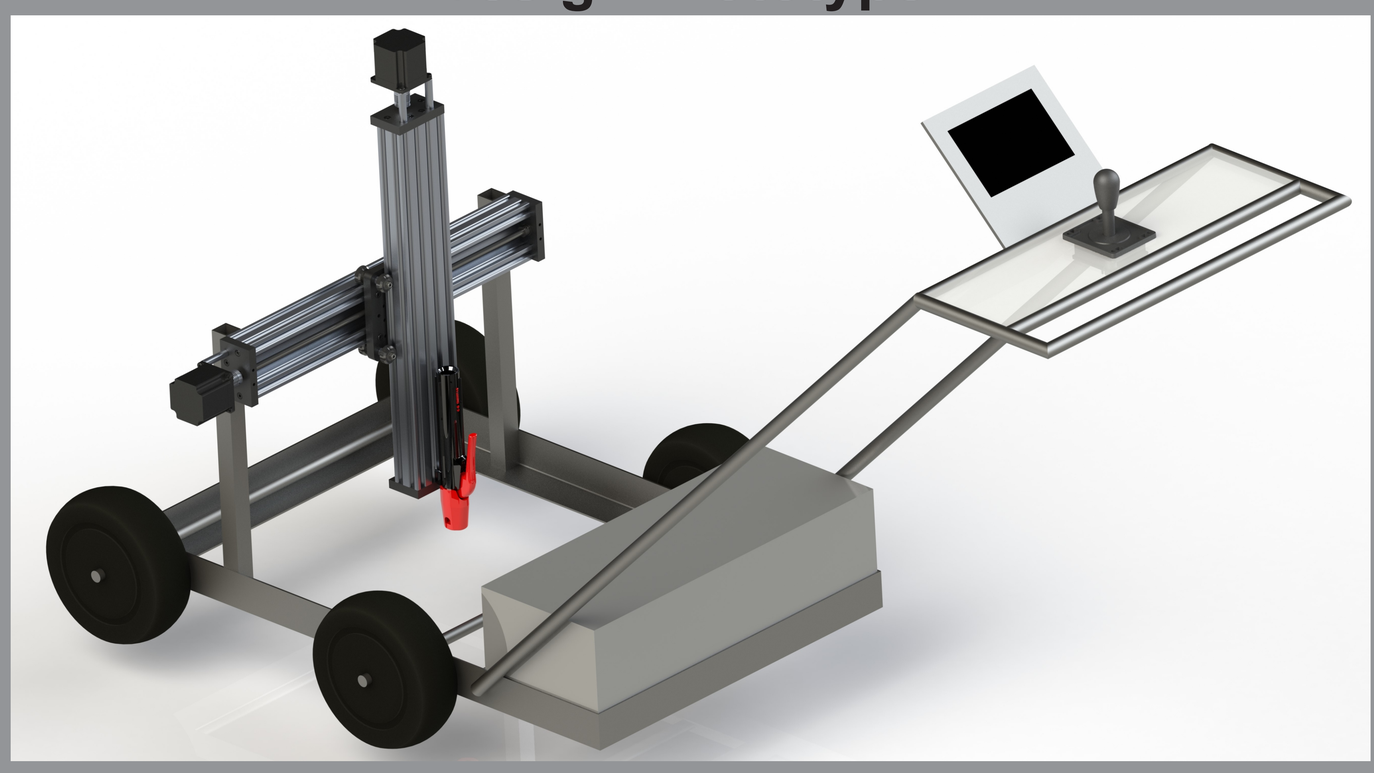
Objectives

Design, develop, and create a machine that assists roof deck welders with the following:

- **Improve the ergonomics of arc spot welding procedure**
- **Eliminate the need to bend at the waist**
- **Reduce the risk of injury to the worker**
- **Increase welding efficiency**
- **Keep welding site clearly visible to worker**

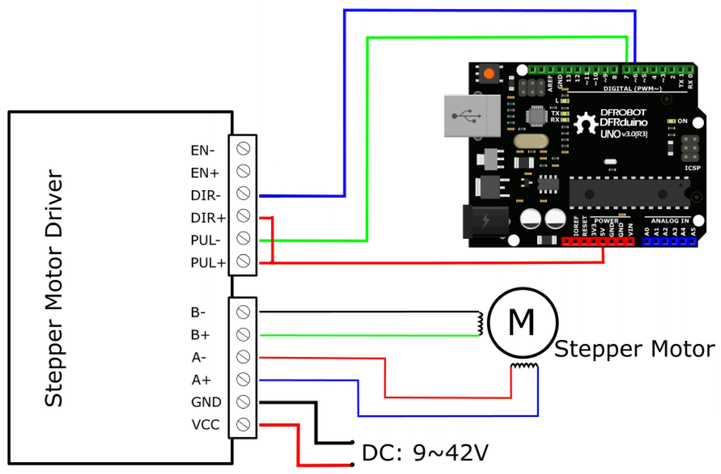


Design Prototype



Design Solution

To meet the objectives, the assisted welding machine uses a lawnmower style design. This allows the worker to control the stinger while standing by attaching it to a gantry which is controlled via joystick.



- **This Arduino schematic was configured and coded to control the motors on the gantry**
- **The system is powered by a 12V DC power supply that is plugged into the welding machine**

Future Works

- **Variable motor speed control**
- **Limit switches to improve safety**
- **Collapsible handlebars to improve portability**
- **Fully automate gantry motion**

Conclusion

This design allows workers to perform precise arc spot welds for 6" flutes while staying in a standing position.

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