

A Method of Manufacturing Low Cost Utility Robots and Vehicles

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Abstract : Introduction and Objective: Climate change and a global economy mean farmers must adapt and gain access to affordable and reliable automation technologies. Key barriers include a lack of transportation, electricity, and internet service, coupled with costly enabling technologies and limited local subject matter expertise. Methodology/Approach: Resourcefulness is essential to mechanization on a farm. This runs contrary to the tech industry practice of planned obsolescence and disposal. One solution is plug-and-play hardware that allows farmer to assemble, repair, program, and service their own fleet of industrial machines. To that end, we developed a method of manufacturing low-cost utility robots, transport vehicles, and solar/wind energy harvesting systems, all running on an open-source Robot Operating System (ROS). We demonstrate this technology by fabricating a utility robot and an all-terrain (4X4) utility vehicle. Constructed of aluminum trusses and weighing just 40 pounds, yet capable of transporting 200 pounds of cargo, on sale for less than \$2,000. Conclusions & Policy Implications: Electricity, internet, and automation are essential for productivity and competitiveness. With planned obsolescence, the priorities of technology suppliers are not aligned with the farmer's realities. This patent-pending method of manufacturing low-cost industrial robots and electric vehicles has met its objective. To create low-cost machines, the farmer can assemble, program, and repair with basic hand tools.

Keywords : automation, robotics, utility robot, small-hold farm, robot operating system

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