Industry
Apparel

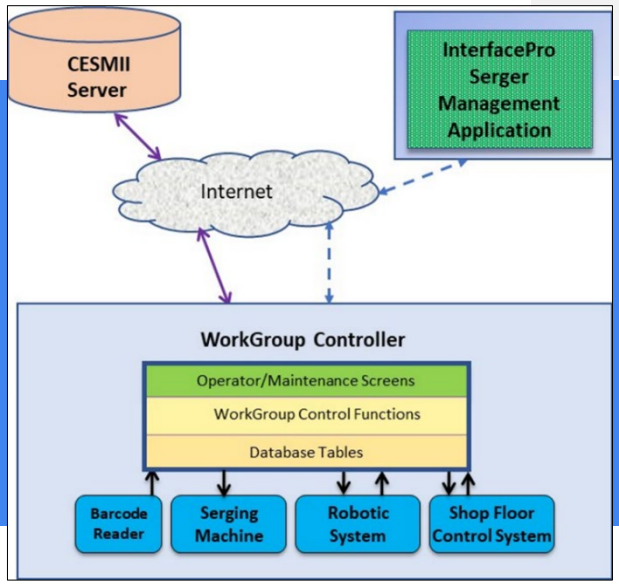
Technologies
Connectivity
Data Contextualization

Solutions
Manufacturing Productivity
Schedule Optimization

CESMII
THE SMART MANUFACTURING INSTITUTE

PROJECT CASE STUDY

Robotic Work Cell Integration for Apparel Manufacturing



PROJECT LEAD

Interface Technologies

PROJECT TEAM

RPI, Computer Graphics Systems

PROJECT OBJECTIVE

Develop Smart Manufacturing Profiles and software to enable robotic sewing systems to bi-directionally communicate real-time production, product, and machine data with plant and enterprise systems to lower the adoption costs of robotics in the apparel industry.

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Smart Manufacturing Researchers Demonstrate Novel Robotic Sewing System

BENEFITS TO OUR NATION

The implementation of smart manufacturing tools may allow American companies to bring apparel manufacturing back to the United States. Rebuilding domestic apparel production would add scores of jobs in the apparel industry and its supply chain. The revitalization of any manufacturing sector would have an outsized impact on the American economy, creating high-paying jobs, boosting earnings, and spurring continued growth and investment in the broader American economy.

BENEFITS TO INDUSTRY

To date, apparel production has resisted automation. The sector currently requires vast numbers of human sewing machine operators to assemble fabric into clothing. Manufacturers have been unable to design automated machines that can handle cut pieces of fabric, leaving apparel production as one of the last industries that require laborers to perform repetitive, difficult tasks. If the technology developed in this project can be implemented by American clothing companies, the domestic apparel manufacturing industry could be revitalized. Clothing companies could evolve from brand and fashion houses to complete vertically integrated design, manufacturing, and distribution enterprises.

PROJECT DESCRIPTION

TECHNICAL APPROACH

- Develop Smart Manufacturing Profiles for edge devices to communicate with a Robotic Sewing Work Cell. The SM Profiles will incorporate the reporting and control parameters required by the Work Group Controller (WGC) of the Work Cell.
- Create an instance of the SM Profile to develop an interface to the Industrial Partner's BlueCherry Shop Floor Control System using the SM Profile and Smart Manufacturing Innovation Platform Application Programming Interfaces.
- Develop the WGC application to perform real-time process reporting from the robotic sewing system to the Shop Floor Control System.

ACCOMPLISHMENTS

- Developed SM Profiles for sewing system components.
- Developed a bi-directional ingestion pipeline to transmit and retrieve data between the Work Group Controller and the CESMII Server.
- Developed an information management application that sends real-time part and process data from the Work Group Controller to the CESMII server.

DELIVERABLES

- Delivered sewing system components SM Profiles.
- Delivered complete source code package for SM Profile interface ingestion pipeline.
- Delivered complete Sewing System Management Application Source Code package.

REUSABLE OUTCOMES / SM MARKETPLACE

- Sewing system component SM profiles.
- Sewing Machine System Management Application.

PROJECT DETAIL
Budget Period: BP4
Submission Date: 6/14/2023
Sub-Award (contract) Number:
4550 G ZA105
SOPO: 2344

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This material is based upon work supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under the Clean Energy Smart Manufacturing Innovation Institute (CESMII) Award Number DE-EE0007613.