Intelligent workplace for flexible manufacturing

Summary

The main objective of the research is to develop the intelligent workplace of mechanical product assembling with AI functionality, for flexible manufacturing in the field of mechanical engineering, electronics, furniture, and food industries

Research field:	Mechanical engineering
Supervisors:	Prof. Dr. Raivo Sell Kristo Karjust
Availability:	This position is available.
Offered by:	School of Engineering Department of Mechanical and Industrial Engineering
Application deadline:	Applications are accepted between November 16, 2020 00:00 and December 16, 2020 23:59 (Europe/Zurich)

Description

Description
In production where, manual labour share remains high due to design constraints the efficiency growth can be established through intelligent solutions which speed up the assembly work and assure quality performance.
In a future workplaces, the production employee must be supported with system info about how to assemble the product, which tools to use, feedback if connections have been made with correct torques, right components assembled in right order and instructed how to correct the mistakes in real time.

Workplaces and their optimization and modification procedures are considered as basis for company performance improvement. Factors influencing the workplace performance influence the whole company through the processes and systems, which the workplace is related and because of that it is crucial to development and optimization the intelligent mechanical product assembling workplace.

Workplaces of mechanical product assembling are constrained by manual assembly work, lack of data integration, dependency of manual data input about production efficiency and quality performance. Production output control process contains waste (muda) due to faults not becoming visible before final inspection and depends on human work discipline and eye for errors.

Main objective of the thesis
The main objective of the research is to develop the intelligent workplace of mechanical product assembling with AI functionality, for flexible manufacturing in the field of mechanical engineering, electronics, furniture, and food industries.

The research is focusing on the following general topics:

- Concept development for intelligent workplace of mechanical product assembling for flexible manufacturing
- Development of smart data collection system for intelligent workplace
- Intelligent workplace human or robot movements optimization using Artificial Intelligent and Machine Learning concepts
- Development of intelligent workplace prototype for flexible manufacturing

Requirements

- The candidates should have practical and research competences and knowledge in electronics solution design.

- Candidate should have also microcontroller programming experience.

To get more information or to apply online, visit https://taltech.glowbase.com/positions/189 or scan the the code on the left with your smartphone.