

Human-Centric Wearable Sensor Stack for Human Health and Wellbeing in Industrial Assembly

The **SENSORSTACK** Project by Pumacy Technologies AG was selected as one of the projects in the **EARASHI Open Call 2**. It addresses a critical challenge in ergonomics optimization for assembly line operators, particularly in the white-goods and automotive industries. The primary focus is on the continuous improvement of working conditions related to posture and process, which significantly affect workers' physical and mental health, stress levels, and overall well-being. The project employs motion tracking and AI to monitor and identify potential issues with posture, process, or strength requirements within work cells.

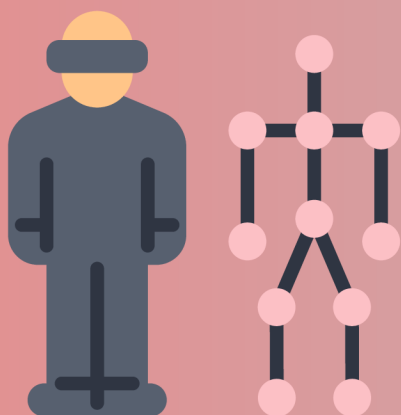
CHALLENGES

SENSORSTACK aims to solve various ergonomics and process challenges in the assembly work cell:

- Assembly of small systems causes posture problems leading to mental and physical fatigue as well as musculo-skeletal pain in the long term.
- Complexity and dexterity make humans essential assets for these manufacturing processes.
- Human-centric wearable solutions are needed to improve working conditions and efficiency.



SOLUTIONS



Smart Glasses for Visual Aid



Convenient Wearable IMUs



Smart Glove



Data Analytics with Machine Learning

Hardware Layer

Smart Glove: Pressure and Torque Measurement

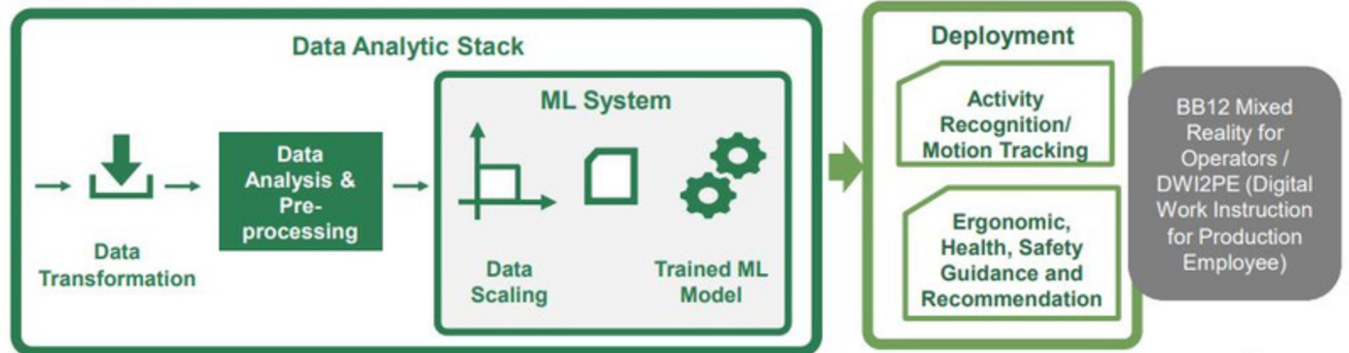


MS Hololens: Work Instructions, Ergonomic Recommendations



Wearable IMUs: 3D-Motion tracking

Software / AI Layer



MAIN GOALS

- Operator Issue Detection
- Worker Well-being
- Preventive Signaling
- AI-powered Analysis
- Pilot Demonstration and Validation

KEY ACHIEVEMENTS



Solution thoroughly tested in lab environment



Solution demonstrated in European production facility (consumer goods)



Ergonomics Services deployed for construction manufacturing



Process analysis provided for different use cases in industrial assembly



SensorStack is aiming to become affordable, ergonomic, and leverage the work experience of the human in assembly work places. We are convinced, that we have a system, that will improve process efficiency & ergonomics, while leading to cost savings for the client companies.



The SENSORSTACK project has thrived due to the invaluable financial backing and services support from the EU. This crucial assistance has empowered the research and development of state-of-the-art AI solutions, including motion tracking, and has made it possible to implement and test these technologies in real-world scenarios with great success.

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