TECH OFFER

AI-Powered Tactile Intelligence Platform for Back Injury Prevention

KEY INFORMATION

TECHNOLOGY CATEGORY:
Electronics - Sensors & Instrumentation
Infocomm - Wearable Technology
Infocomm - Artificial Intelligence
Infocomm - Healthcare ICT

TECHNOLOGY READINESS LEVEL (TRL): TRL9
COUNTRY: SINGAPORE
ID NUMBER: TO175481

OVERVIEW

For organisations struggling with high rates of musculoskeletal injuries, rising ergonomics-training costs, and limited real-time insight into worker strain, current solutions remain reactive and inefficient. Most companies still depend on consultants and manual observations for ergonomics reporting—an approach that is subjective, inconsistent and expensive. The global safety consulting and training market is projected to reach USD 53 billion by 2025, yet much of that investment goes toward periodic assessments that fail to prevent injuries before they happen.

Designed for sectors such as logistics, manufacturing, healthcare, construction, and oil and gas, the solution is an AI-powered ergonomic safety vest that replaces traditional audits with continuous, real-time measurement of core back pressure and force data. Beyond exertion, the system also features AI posture prediction capable of identifying key movements such as good pick-ups, upright, forward bends, backward bends, and twisting, giving organisations deeper visibility into high-risk behaviours. By

mapping these measurements to the Borg CR-10 exertion scale, it quantifies physical strain with a level of precision previously unavailable in the field. This wearable technology offers a scalable, camera-free, data-driven alternative to manual training and audits. By embedding tactile intelligence into everyday workwear, it helps organisations reduce injury rates, lower costs, and build safer, smarter, more productive workplaces.

TECHNOLOGY FEATURES & SPECIFICATIONS

Platform Overview

Powered by Agentic AI, the platform automatically delivers personalized safety recommendations, automated KPI and risk reports, and anonymized, auditable compliance data. It not only detects high-risk postures and early signs of fatigue, but also guides workers to correct their movements instantly, reducing injury risk and improving long-term ergonomics.

Key Components

1. Wearable Sensor Module: Equipped with tactile sensors that capture multidirectional pressure and force patterns from the user's lower back.

2. Embedded AI Algorithm: Classifies body postures, detects improper lifting or bending techniques, and triggers haptic feedback.

3. Cloud Analytics Platform: Aggregates real-time data from multiple users to deliver organizational insights, risk scoring, and an ergonomics dashboard.

4. Tactile Foundation Model: A proprietary foundational model trained on diverse tactile datasets. Capable of adapting across domains such as logistics, healthcare, and sports to deliver context-aware safety intelligence.

POTENTIAL APPLICATIONS

The technology can be applied across multiple sectors, including workplace health and safety, where it supports injury prevention and posture monitoring for logistics, manufacturing, and construction workers. In healthcare and rehabilitation, it enables posture correction and movement tracking to assist physical therapy and musculoskeletal recovery. For sports and fitness, it provides movement efficiency analysis and early injury risk detection to help athletes and trainers optimize performance. It also enhances robotics and human–machine interaction by integrating tactile data to improve ergonomic collaboration between humans and robots.

These capabilities translate into a range of marketable products, such as smart posture belts and vests, industrial safety monitoring platforms, rehabilitation and physiotherapy assistive systems, and fitness coaching wearables equipped with tactile feedback.

UNIQUE VALUE PROPOSITION

Unlike vision-based monitoring systems that rely on cameras and clear line-of-sight, this tactile AI technology is fully wearable and suitable for any work environment. By capturing biomechanical data directly from body pressure, it enables real-time and proactive injury prevention rather than merely detecting issues after they occur. Its predictive tactile analytics allow the system to anticipate risky movements, while its scalable AI foundation continually improves by learning from an expanding database of tactile data points. The technology is highly adaptable across industries—from logistics and healthcare to sports—and is built with

a privacy-first design that avoids the use of any video or image data.

The technology owner is seeking R&D collaboration and test bedding opportunities with industrial safety-equipment manufacturers, AI research institutes specialising in human-sensing technologies, and IHLs or companies with commercially ready sensing solutions. Partnerships with workplace health and safety service providers, as well as rehabilitation and sports-tech companies, are also welcomed to co-develop use cases, validate performance in real-world environments, and accelerate the path toward market adoption.