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Automated Monitoring System for Biomechanical Postural Assessment

This technology offers an automated analysis software that can assess postures onsite and in real-time. It can provide reader-friendly reports using a standard digital camera and monitor human postures in real-time.

What is the Problem?

In 2018, 2.9 million Americans suffered from a nonfatal workplace injury, with many of the injured missing some work. Many of these injuries were the result of overexertion or repetitive, non-ergonomic movements. Early ergonomic interventions can reduce movement- and posture-related injuries in the workplace, minimizing loss of productivity and reducing healthcare costs for employers. However, there is no reliable way to regularly monitor whether workers are practicing ergonomic techniques on the job. Onsite ergonomic assessments are typically conducted only a few times a year and are often subjective. Recently, there have been attempts to use 3D motion capture as a method to evaluate human posture, but this requires a proprietary imaging system with the subject having to wear trackable markers or devices. Furthermore, both the assessment and the analysis are limited to a laboratory setting and not in the working environment, and thus the movements assessed might not be as authentic or relevant to the actual workplace.

What is the Solution?

The inventors have developed a technology that provides automated analysis software that can assess postures onsite and in real-time. This software provides reader-friendly reports and only requires a standard digital camera. There is an online mode, which detects human posture, then assesses a person's posture using conventional postural evaluation metrics from assessments such the Rapid Upper Limb Assessment (RULA). There is also an offline mode, which can provide a more detailed evaluation of the postures, which would show the posture biomechanics and compile these data into a report for analysis.

What Differentiates it from Solutions Available Today?

Existing solutions cannot complete evaluations in the working environment in real time, and instead must conduct assessments in a laboratory setting, which may not lead to relevant data, and is disruptive to the workflow. This technology could be used for real-time monitoring and assessment of multiple worker postures in the workplace setting, thus reducing exacerbation of current injuries, and preventing work-related injuries in the future.

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