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Occupational wrist postural assessment and monitoring system : Development and initial validation (Article)

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Abstract

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Identification and quantification of poor wrist postures at the occupational setting are generally challenging due to rapid changes in wrist movement. A system prototype was developed to capture and assess wrist postural behaviour at the workplace. This manuscript describes the development and initial validation process of the system prototype. The system prototype utilizes wearable glove attached with Inertia Measurement Unit (IMU) sensors to capture wrist postural behaviours. The postural angle data from sensors were extracted and processed through a customized programming software for visualization purpose. The real-time wrist postural angle data at work is benchmarked and normalized to personal maximum wrist Range of Motion (ROM) data. Preliminary validation compared the wrist postural angle readings between system prototype and traditional goniometer, at 30◦ for ulnar, radial, flexion, and extension wrist positions. Overall, the results from one sample t-test across 31 subjects indicate statistically no significant differences between the system prototype and goniometer readings at alpha level 0.05 (p-value > 0.05). The results from this preliminary validation activity demonstrate a degree of accuracy in terms of capturing wrist postural angle when being compared to goniometer. © School of Engineering, Taylor's University.

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References (26)

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1 (2015) *Nonfatal Occupational Injuries and Illnesses Requiring Days Away from Work*. Cited 322 times. 2015. Retrieved June 6, 2018, from
Bureau of Labor Statistics

2 Jackson, R., Beckman, J., Frederick, M., Musolin, K., Harrison, R.
Rates of carpal tunnel syndrome in a state workers' compensation information system, by industry and occupation — California, 2007-2014
(2018) *Morbidity and Mortality Weekly Report*, 67 (39), pp. 1094-1097. Cited 4 times.
https://www.cdc.gov/mmwr/volumes/67/wr/pdfs/mm6739-H.pdf
View at Publisher

3 Marcum, J., Adams, D.
Work-related musculoskeletal disorder surveillance using the Washington state workers' compensation system: Recent declines and patterns by industry, 1999-2013
(2017) *American Journal of Industrial Medicine*, 60 (5), pp. 457-471. Cited 14 times.
http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1097-0274
doi: 10.1002/ajim.22708
View at Publisher

4 Pourmemari, M.-H., Heliövaara, M., Viikari-Juntura, E., Shiri, R.
Carpal tunnel release: Lifetime prevalence, annual incidence, and risk factors
(2018) *Muscle and Nerve*, 58 (4), pp. 497-502. Cited 12 times.
http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1097-4598
doi: 10.1002/mus.26145
View at Publisher

5 Rempel, D.M., Keir, P.J., Bach, J.M.
Effect of wrist posture on carpal tunnel pressure while typing
(2008) *Journal of Orthopaedic Research*, 26 (9), pp. 1269-1273. Cited 46 times.
doi: 10.1002/jor.20599
View at Publisher