DEPARTMENT OF COMMERCE

NATIONAL INSTITUTE OF STANDARDS AND TECHONOLOGY

Proposed Information Collection; Comment Request; Analysis of Exoskeleton-Use for Enhancing Human Performance Data Collection.

AGENCY: National Institute of Standards and Technology, Commerce.

ACTION: Notice.

SUMMARY: The Department of Commerce, as part of its continuing effort to reduce paperwork and respondent burden, invites the general public and other Federal agencies to take this opportunity to comment on proposed and/or continuing information collections, as required by the Paperwork Reduction Act of 1995.

DATES: Written comments must be submitted on or before [*I*NSERT DATE 60 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: Direct all written comments to Jennifer Jessup, Departmental Paperwork Clearance Officer, Department of Commerce, Room 6616, 1401 Constitution Avenue NW, Washington, DC 20230 (or via the Internet at PRAcomments@doc.gov).

FOR FURTHER INFORMATION CONTACT: Requests for additional information or copies of the information collection instrument and instructions should be directed to Elizabeth Reinhart, NIST Management and Organization Office, 100 Bureau Drive, Gaithersburg, MD 20899; 301-975-8707; elizabeth.reinhart@nist.gov.

SUPPLEMENTARY INFORMATION:

I. Abstract

Exoskeletons – sometimes called wearable robots – are a very rapidly expanding domain with a range of applications and a broad diversity of designs. NIST's Engineering Laboratory will be developing methods to evaluate performance of exoskeletons in two key areas 1) The fit and motion of the exoskeleton device with respect to the users' body and 2) The impact that using an exoskeleton has on the performance of users executing tasks that are representative of activities in industrial settings. The results of these experiments will inform future test method development at NIST, other organizations, and under the purview of the new American Society for Testing Materials (ASTM) Committee F48 on Exoskeletons and Exosuits.

For the first research topic, NIST will evaluate the usefulness of a NIST prototype apparatus for measuring the difference in performance of a person wearing an exoskeleton versus the person's baseline without the exoskeleton while positioning loads and tools. The NIST Position and Load Test Apparatus for Exoskelons (PoLoTAE), which presents abstractions of industrial task challenges, will be evaluated in this research.

For the second research topic, NIST will evaluate a method for measuring the alignment of an exoskeleton to human joint (knee) and any relative movement between the exoskeleton and user. Measurement methods prototyped by NIST for evaluating exoskeleton on mannequin position and motion will be applied to human subjects to verify the usefulness of optical tracking system and designed artifacts worn by users as measurement methods.

Participants will be chosen from volunteers within NIST and adult NIST visitors to participate in the study. Gender and size diversity will be sought in the population of participants. No

personally identifiable information (PII) will be recorded unless subject consent for PII disclosure is received. NIST intends to publish information on the analysis and results.

II. Method of Collection

Participants will give informed consent prior to participating in the research. Information may be collected via a paper background questionnaire which may include disclosure of health information which may be relevant for safety and research reasons. Data will be collected using a combination of heart rate monitor, and video and still cameras to collect time and subject activity to correlate heart rate with activity and an optical tracking system which detects markers. Participants will be asked to complete a paper survey once data is collected for the research.

III. Data

OMB Control Number: 0693-0083.

Form Number(s): None.

Type of Review: Revision and extension of a current information collection.

Affected Public: Individuals or households.

Estimated Number of Respondents: 250

Estimated Time Per Response: 1.5 hours

Estimated Total Annual Burden Hours: 375 hours

Estimated Total Annual Cost to Public: $0

IV. Request for Comments

NIST invites comments on: (a) whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the

information will have practical utility; (b) the accuracy of the agency's estimate of the burden (including hours and cost) of the proposed collection of information; (c) ways to enhance the quality, utility, and clarity of the information to be collected; and (d) ways to minimize the burden of the collection of information on respondents, including through the use of automated collection techniques or other forms of information technology.

Comments submitted in response to this notice will be summarized and/or included in the request for OMB approval of this information collection; they also will become a matter of public record.

Sheleen Dumas,

Departmental Lead PRA Officer, Office of the Chief Information Officer, Commerce Department.

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