Wearable Ergonomic Sensor Technology

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Wearable Ergonomic Sensor Technology

- The shipbuilding and repair industry continues to experience a significant frequency of body motion (ergonomic) type injuries.

- To date our approach to ergonomic improvements has been largely reactive, an ergonomic evaluation is triggered by either an accident or an evaluation request by an employee.

- We seek to build effective sensor technology in order to obtain biomechanical and physiological data so that we can quantify ergonomic risk.
  - This data is to be gathered in real time in order to quantify the risk of body motion injury for a specific job or job sequence.
  - The sensors must operate in the challenging environments of shipbuilding

- This gives the ability to prioritize jobs for ergonomic improvement/spending
  - This brings our ergonomic approach into the proactive sphere

Wearable Ergonomic Sensor Technology

- There are many shipbuilding jobs that require our employees to work in awkward positions for long periods of time.
  - Welders, shipfitters, electricians, inside and outside machinists and pipefitters often work in awkward positions for several hours at a time in order to accomplish their jobs
  - The result over any length of time is an increase in the probability of body motion injuries

Wearable Ergonomic Sensor Technology

- The goals of Wearable Ergonomic Sensor Tech are:
  - To combine data collection, modeling and stress calculations into one real time program
  - To use the resulting product to evaluate jobs throughout the shipyard to prioritize Ergonomic Intervention
  - To further collect data on ergonomic improvements to make sure selected improvements actually reduce the risk of body motion injury
  - To help Ergonomic Programs to become proactive
  - To provide data for yearly Ergonomics program funding

Early MetriX by SuitX

How does MetriX work?

The MetriX system includes:

Nodes

- Wearable sensors designed for 8 hours of use

Mobile app

- Interface to create risk studies and to display an employee's live posture/risk motion

Charging Dock

- Charges the Nodes
- Uploads data to the web interface

Web Interface

- Displays ergonomic risk data in a actionable way

Early MetriX by SuitX

How does MetriX work (continued)?

Workers wear nodes on body parts that are at risk, such as:

- Trunk (demoed)
- Upper Arm (future)
- Wrist (future)
- Neck (future)

The nodes continuously measure the posture of the worker, and store this data over the work day or task time.

Device calculates overall risk of person based on their posture throughout the time worn.

Lastest MetriX by SuitX

https://drive.google.com/file/d/1CtVQBH3cS4u0CioQz4vQzTSbAd3eu5Sk/view?usp=sharing

GoX Labs

The GoX system includes:

Pods (torso and ankle pods complete)

- Wearable sensors designed for 8 hours of use, one torso or lower back, one neck (to give spinal positional data between the two), arms, wrists and ankles. The pods at the right are the torso pods.

Heart Rate Monitor (off the shelf)

- FitBit style Heart Rate Monitor measures heart rate and VO2 levels

Insoles

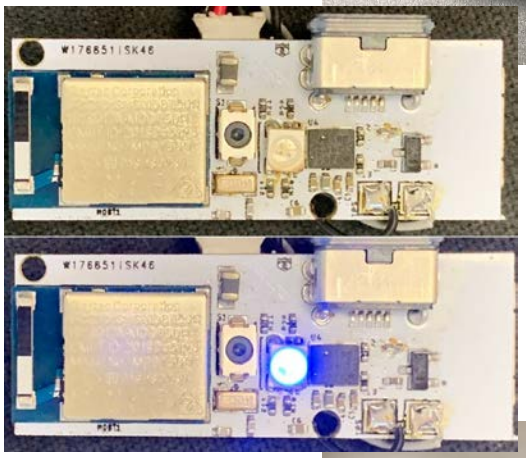
- Presently measure vertical ground reaction forces that are distributed from heel to toe. Future state will measure weight of materials/tools the craftsman uses.

Mobile app (Mesh Network complete)

- Interface records data and downloads to GoX web interface upon completion of tasking
- Uploads data to the web interface

Charging Dock

- Charges the Nodes



Questions?