

Flexible Wearable Sensors for Injury Prevention and Performance Improvement

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Introduction

- Injury prevention is a vital study for the health and safety of manual labor workers.
- Many manual labor jobs have been automated, but little development has been made for reducing the physical stress imposed by jobs that cannot be automated.



Figure 1. Masonry worker injury prevention study

Method

Prototyping Process:



Results

Observation:

- The glove successfully outputs voltage readings when pressure is applied.
- Voltage values are converted into force using a calibration curve.
- Sensors have high resolution/can sense small changes in force.



Figure 4. Prototype Assembly of Flexible Pressure Sensing Glove

Conclusions

- The project was a success. The glove provides pressure readings accurately for multiple sectors of the hand.
- Final prototype cost was under \$200.
- Glove is modular and ready for further development for more intricate data acquisition.
- Ready for use in cutting-edge biomechanical studies.

Future Refinements:

- Improve wireless functionality
- Swap to a more advanced sensor type
- Reliability improvements

Objectives

- Construct a prototype pressure sensing glove utilizing flexible sensor technology.

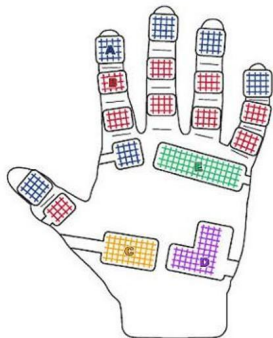


Figure 2. \$35k Tekscan Grip System industry example

Materials

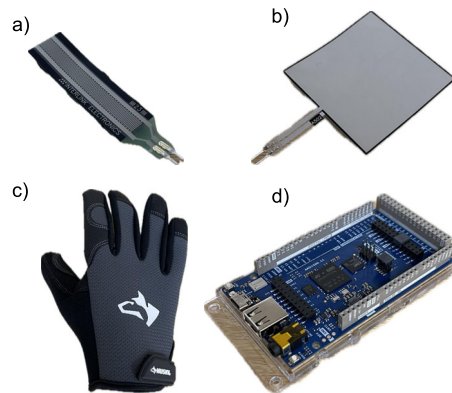


Figure 3. Materials needed for glove prototype. a) finger pressure sensor b) palm pressure sensor c) work glove d) Arduino Giga board

References

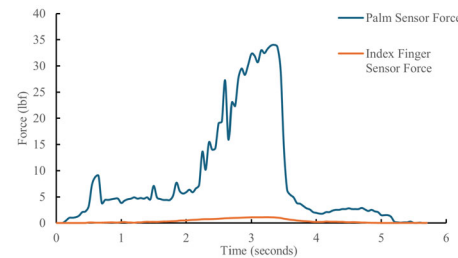


Figure 5. Force induced by gripping a cylinder as measured by the glove