Wearable Robots for Worker Assistance

Human Machine Integration Laboratory

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Wearable robotic systems will assist workers:
a. to lift heavy objects,
b. palletize, and
c. perform tasks with less fatigue.

This growing field is moving from the military super-suits to the industrial and manufacturing workplace.

What is Fueling the Growth of Wearable Robotic Systems?

- Global Demographics
  - Older workforce
- Better robotic systems
  - Batteries, sensors, actuators, microprocessors

Cyberdyne

What is a Wearable Robotic System?

- **Device worn on the body to assist the user**
  - Anthropomorphic or Non-anthropomorphic

- **Device can be Passive or Active**
  - Passive systems use springs or structures to push or pull on the body
  - Active systems use motor/pneumatics/hydraulics to assist the user in the task. "Put energy into the system"
- **Device can assist a joint or transfer the load to the ground**

Assistive

Walking Assist Device, Honda, Japan

Bodyweight Support Assist, Honda, Japan

Power Assist Suit, Kawasaki, Japan

Panasonic, Japan

Innophys, Japan

Hexar Systems, Korea

B-temia Keeogo, Canada

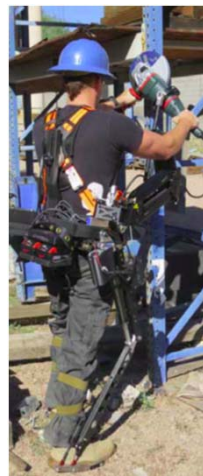PhaseX AB, Sweden

Manufacturing and Construction

Daewoo, Korea

RB3D, France

Fortis, USA

BAE Systems, England

MAX Exoskeleton, US Bionics

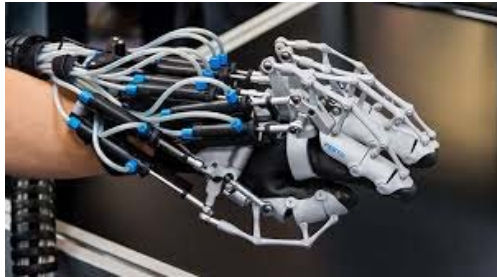# Manufacturing and Construction

Cyberdyne, Lumbar System

Robomate, Germany

Panasonic, Japan

Arm Exoskeleton,
Stuttgart, Germany

Festo, Germany

Cybergrasp, USA

Roboglove, Bioservo, USA

Manufacturing and Construction

Strong Arm, USA

Noonee, Switzerland

X-Ar Equipois Inc. (USA)

Laevo, NL