

## Beyond Exoskeletons - Wearable Exosuit Technologies

Roy Kornbluh\*, Kate Witherspoon, Rich Mahoney, Brian McCoy, Paul Birkmeyer, Alex Kernbaum  
SRI International, Menlo Park, California

SRI is developing wearable "exosuits" that can augment the musculoskeletal system for performance and strength enhancement and assistance to overcome or prevent damage from injury or disease. SRI's exosuit differs from exoskeletons by using new muscle-like actuation, comfortable and soft skin attachment, and electronically-releasable spring elements to minimize mass, bulk, and noise as well as eliminate constraints on natural joint motions. As part of DARPA's Warrior Web Program, the technology is being applied to prevent and reduce musculoskeletal injuries caused by dynamic events typically found in the warfighter's environment. We are exploring other military applications and beginning to use the technologies to assist individuals with musculoskeletal diseases.

### flex Controls

Intuitive terrain adaptive control and user interface



### Herr-Endo Model

Simple Under-actuated Model-inspired architecture



### flexGRIP

Flexible and comfortable load transfer



### flexDRIVE

Lightweight, conformal and efficient Exomuscles



## SUPERFLEX Biofidelic Robotic Exosuit - Not your father's exoskeleton

Novel lightweight and flexible components combined with a simple under-actuated architecture and biomimetic control enable a soft, comfortable and lightweight undergarment for human performance enhancement and injury mitigation