

## **Technical Abstract**

### **Title: NEADL - A Novel Electronic Aids for Daily Living System for People Who Cannot Use Their Hands**

CreateAbility will research and develop natural support mechanisms to improve the quality of life for people who cannot use their hands and must use voice command or switch interfaces to interact with their environment. This project will demonstrate the technical merit, feasibility and cost efficiency of combining commercially available Electronic Aids for Daily Living (EADL) technology with an innovative design and state-of-the-art intelligent wireless sensors to produce NEADL - a “Novel” EADL system that: 1) gives the individual an exceptional flexibility and interaction with their environment through the integrated control and status of appliances and items, 2) detects the status of specific factors in the environment, and dynamically adjust the delivery of prompts and reminders to properly instruct or inform the individual based on these factors, and 3) enables monitoring and automatically generates alarms and nurse calls. The interactions with their environment through the integration of feedback of the status of specific elements with control of the same or different elements greatly facilitates freedom and independence without compromising safety.

Specific objectives for Phase I are to: 1) determine the end user requirements, 2) develop a proof-of-concept prototype of the NEADL system, and 3) perform a usability analysis with actual users.

### **Anticipated Results and Implications of the Approach**

This project targets a population that has been under-served by existing technology. The built in natural support mechanisms promote independence, enhance self-esteem, and create opportunities for self-direction in a respectful, non-invasive approach. Activities of daily living can be accomplished with less assistance and without compromising safety. Beyond increased quality of life to the individual, the system will help reduce caregiver costs and reduce caregiver fatigue.

### **Potential Commercial Applications**

The potential commercial applications of the NEADL system are substantial due to the large pent up demand because this system is lower cost and addresses the issues that have previously resulted in relatively low utilization rates of EADL systems. Individuals with Spinal cord injury, ALS, tetraplegia, Multiple Sclerosis, Muscular Dystrophy, Cerebral Palsy or severe Carpal Tunnel Syndrome that previously relied on the assistance from others, can now more fully and independently interact with their environment. This research and development will result in an affordable product following a successful Phase I and Phase II.