Enhancing Activity Levels for Older Adults

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I. Introduction

The gap between current technological intervention and its application in the human environment has markedly affected where, how, why, and when persons age. The lack of fit between the person and the environment has resulted in premature aging and the escalation of disease states. The freedom and independence afforded by recent technological advances has not been reflected in the home setting, institutions providing services to older persons, nor in the lifestyles of older individuals. Despite recent technological advances, older persons continue to live in antiquated and wrinkled environments.

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II. Methods

Prosthetic adaptive environments which are technologically malleable can serve to extend the capacities of aging persons and to promote continued maximal functioning. Research on exoskeletons to assist in lifting and reaching capacities has already demonstrated the potential to extend and to enhance the capabilities of older persons to successfully engage in a variety of activities which have diminished through the process of senescence. Exoskeletons can be an asset to offset aging dysfunction, but can also serve to magnify human capabilities beyond their normative state. The purpose of this research project is to enhance the activity levels for older adults through a polymeric exomuscular assistive system. Current products to offset such disabilities are rigid, unwieldly, and intrusive. New products are called for which are light weight, dexterous, and user friendly. In order to compensate for the problems associated with respiratory dysfunction and reduction in muscle function, this project focuses on the development of an artificial muscle to lessen the effort required for mobility, lifting, reaching, and the conducting of the activities of daily living. It incorporates revolutionary materials, portable power supplies, a feedback control system, and computing machines. It is expected that materials utilized in the development of the artificial muscle will culminate in a Polymeric Exo-Muscular Assistance System which will have the potential to enhance elderly mobility and activity levels. It will be fabricated first into a biceps muscular assistance device to assess and to demonstrate its feasibility. Future efforts can potentially include the development of design requirements for muscular assistance devices for all major joints.

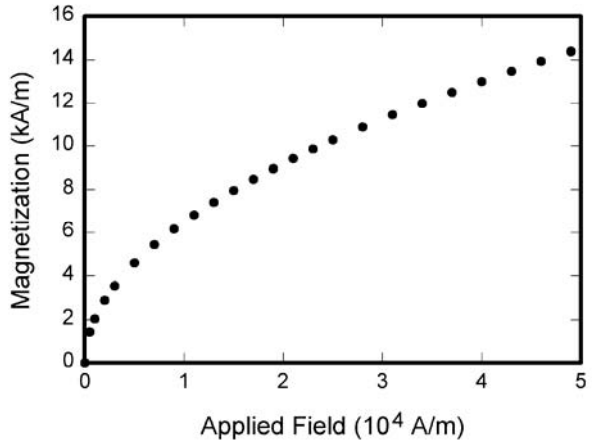

Fig. 1. Magnetization as a function of applied field. Note that “Fig.” is abbreviated. There is a period after the figure number, followed by two spaces. It is good practice to explain the significance of the figure in the caption.

III. RESULTS

The physiological and psychological changes experienced with advancing age can e ameliorated through assistive technologies which aid in mobility and offset dysfunctions in musculature, which lead to problems related to lifting, reaching, and grasping behaviors. This project focuses on the development of an exoskeleton which can assist, magnify, and extend such capabilities. Debilities due to muscular degeneration are augmented by an assistive device which is worn by the user to offset such muscular changes, and to provide physical integrity, as well as the practical capabilities of dealing with problems of everyday life. Although practical applications of this research are a future effort, there is every indication that such interventions have a high utility potential.

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