**Design and Development of a Portable Glove for Home based Rehabilitation**

**Summary – This research focused on the stroke impaired patient’s progress and feedback to the physical therapist. Through periodic graphical or game-like assessments that the patients will complete, the therapist will receive a comprehensive report on how they are doing in their rehabilitation process. This is meant to accompany and enhance the neuroplastic game therapy. In essence, this analysis will demonstrate the current state off the patients and compare it to a fully functional hand.**

**WILL TURN INTO ABSTRACT**

**Phrase Bank:** magnitude of stroke attack or traumatic brain injury.

1. INTRODUCTION

A stroke is a disease that attacks the brain. Specifically, it is a disease that affects the arteries of the brain. In fact, it is so common that it is the 5th leading cause of death in the United States. Stroke is a disease where a blood vessel in the brain is cut off or completely interrupted due to a clog caused by fatty deposits. Because of the clog, the blood vessel may even burst or rupture. As it is commonly known, blood that flows through the body consists of red blood cells. These cells function as the transporters of oxygen through the human body. As a result of stroke, the brain being deprived of oxygen which, in turn, kills off the brain cells. This severe neurological disorder has devastating effects on the functionality of the human body. A stroke can affect each person in unique ways and to various extents. This is because a stroke can occur in any location of the brain with some killing more brain cells than others. For instance, one who is a patient of stroke may struggle with speaking, have problems with their vision, experience paralysis, endure muscle weakness, and face loss of dexterity in the joints.

1. STATE OF THE ART

Similar to the wearable technology that will be presented, there are numerous devices that attempt to satisfy the need of a method that assists in rehabilitation of the hand that has weakened, lost coordination, or experienced impaired dexterity. For example, Smrithi Sasidharan [1] developed a smart glove with the use of resistive strip sensors to analyze the flexion and extension of the index finger and the wrist. Similarly, a group of researchers at the Sapienza University [2] used two LEAP Motion controllers positioned orthogonally to create a virtual glove to assist patients recovering from stroke. They have used 3-dimmensional multi-sensor technology to precisely map the movement and function of the hand. Taking a mechanical approach to stroke recovery, Hong Kai Yap, Jeong Hoon Lim, Fatima Nasrallah, and Chen-Hua Yeow [3] have developed a soft pneumatic glove. Their glove is able to provide physical assistance to the hand to augment the stroke survivor’s motion. Recently, a group of researchers devised the MusicGlove [4] that is intended for the same purpose as the other projects listed. Utilizing an interactive game-based therapy, the MusicGlove [4] is a glove that senses repetitive performance of pinching exercises. These are just a few of the many examples of research that people have contributed to this area in the field within the past few years.

**Phrase Bank:** magnitude of stroke attack or traumatic brain injury.

[1] <https://repository.asu.edu/attachments/158060/content/Sasidharan_asu_0010N_15213.pdf>

[2] <http://www.scitepress.org/Papers/2017/61978/61978.pdf>

[3] <file:///C:/Users/vines/Downloads/fnins-11-00547.pdf>

[4] <https://www.rehab.research.va.gov/jour/2016/534/pdf/jrrd-2015-04-0057.pdf>