The DEKA Arm

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Abstract—The DEKA or “Luke” arm is a new and highly advanced prosthetic limb that uses many different kinds of stimuli to activate it, from muscle contractions to firing neurons. A tool like this is significant for the natural restoration of capability to the injured.

I. INTRODUCTION

Prosthetic arms date back to the ancient times, as early as ancient Egyptians, Greeks, and Romans [6]. During times of struggle, it is very common for people to loose limbs in war, or simply by accident. Today, there are about 50,000 new amputations every year in USA, with about one fourth being arm amputations [6]. To fix this, prosthetics were developed, but in the past the function was limited. Over many years of research and testing, this technology has advanced dramatically. The biggest problem with these devices is that some amputees cannot use the new arm to its full extent. However, the DEKA arm has a solution to this problem.

II. METHODS

The DEKA arm, named after Dean Kamen, so far has about twelve different dimensions of motion, and can perform almost as well as a natural arm can [4]. There are three different types as well; the radial, humeral, and shoulder configuration, depending on where the amputation area is [5]. To control the arm, there are two major parts. First, there are four sensors implanted into the users shoe that control different parts of the arm. Second, more sensors are placed on the muscles of the stump that detect muscle contraction for different controls [2]. Depending on the type of arm (RC, HC, or SC), more control can be accomplished.

III. RESULTS

The Defense Advanced Research Projects Agency, (DARPA) helped fund DEKA, the company based in Manchester, NH to develop this advanced prosthetic. The results of this new invention have been positive and the FDA just approved the arm in May of 2014. This leaves only one more step [2]. This step is to find a commercial partner willing to bring the DEKA arm to market [3]. Once this happens, many wounded soldiers, unfortunate amputees, and even some paraplegics can enjoy a higher quality of life.

REFERENCES