

1 Introduction: Part 1

1.1 Problem Statement

Amputees deal with a lot of hardship. There are infinitely many tasks in day to day life that able bodied people take for granted. A person cannot truly understand how much function a limb accounts for until they lose it. Especially when the appendage they lost is their arm. Anyone can lose an arm, whether it is due to disease, an accident, or combat; and there are amputees of all ages, sizes, and nationalities around the world. In fact, the largest number of amputees come from developing countries where giving birth is more dangerous and medicine or hospitals are less available. One thing that can alleviate some of the struggles for any form of amputation is a prosthetic. Prosthetics come in many forms and all do some part to improve the quality of life significantly for these constituents.

1.2 Intended Users and Uses

Transradial amputees are the projected user for our project however, some of the processes and technologies that we hope to work with could be applied to other amputees. While prosthetic devices are designed and intended for a single user there are many more people that are affected by a properly designed prosthetic. From the intended user, to family members of the user, all the way to a company or even a community. This is all due to the fact that the amputee can now experience a better quality of life both physically and mentally.

1. SPC John Doe
 - a. Demographic: 26 Years old male, Highschool education, with single one bedroom apartment, No significant other or kids, has a dog
 - b. Hobbies: Used to enjoy hunting, working on motorcycles
 - c. Work Motivations: Has a part time job and is unable to work as at his dream job at a mechanic shop.
 - d. Personality: Since accident very skittish around many people, loss of confidence, has a lot of want to get back to his old self
 - e. Values: Religious man, wants to have a family one day, live happy and healthy away from any past experience.
2. Needs to be able to independently move each finger, have some form of touch feedback in order to get a higher quality of life, must be able to withstand daily use and wear from environment and operation, be able to be secured to the user with little to no unintended movement.
3. The prosthetic in question would be used to possibly aid in doing certain occupations. Along with jobs, the prosthetic can aid in certain hobbies as well. The actions in these activities include but are not limited to basic writing, grabbing and picking things up,

pressing buttons, etc. The user can benefit directly from the prosthetic from being able to once again do some of the things that weren't available to them after losing their limb. This can make things easier for them doing everyday tasks and lift a figurative weight off of their shoulders. Another benefit is that this will lighten the work and load the other arm takes which in turn reduces stress, strain, and overuse.

[Depression among amputees - PubMed \(nih.gov\)](#)

[Evaluation of treatment of psychiatric morbidity among limb amputees - PMC \(nih.gov\)](#)

[What Are Some of the Long-Term Physical Effects of Using or Not Using a Prosthesis? - Amputee Coalition \(amputee-coalition.org\)](#)