**Abstract**

Tragic road accidents happen every day, and in 2014, 81.2% of animal traffic accidents involved canines (Canal et. al., 2018). They often result in severe and traumatic injuries that lead to amputations, the surgical removal of a nerve-dead limb. Many amputated dogs have limited mobility caused by the lack of a prosthetic limb, which are expensive and not widely accessible. This leads to increased health problems, such as weight gain, which often ends in premature euthanasia. Prosthetics provide many benefits to amputee dogs, like lower risk of weight gain and increased mobility, which improves overall health. The objective of this project was to improve the mobility of a dog that has an amputated front left limb. The cost of this prosthetic was lower compared to currently available prosthetics because it was primarily 3D printed. The main goals of the prosthetic were to be functional, lightweight, and able to withstand daily activity. Measurements of the client were used to model a 3- component prosthetic with CAD. The design was then 3D printed and assembled. The prosthetic was fitted on the client, modified, and then the client was then put through a series of tests without the prosthetic and with the prosthetic on to analyze the impact of the prosthetic. On average, the client was able to move faster, and the addition of the artificial limb decreased the pressure on the other limbs by stabilizing the clients' body weight across four "limbs" instead of three. This improved the overall gait of the client. This is extremely beneficial to the animal because it improves their quality of life and reduces the likelihood of future health problems. The engineering concepts implemented in this project can be applied to other canine and veterinary prosthetics.

Keywords: mobility; gait; amputation; prosthetics