ACI: Sight for Blind Animals

Team Name: AniSight
Team Members: Rina Yoo, Sridevi Kashinath Alawandi, Yeonsoo Chang

Our motivation is to help blind animals navigate safely wherever they go. Owners who have blind pets, such as dogs and cats, must pay extra attention at all times so that their pet doesn't get potentially injured. The quality of life for blind animals and their owners would significantly increase with the use of assistive technology. The animal's probability of getting injured while navigating decreases and allows animals to have a more normal life. This kind of assistive technology can be used by pet owners at the domestic level, and eventually, we hope this technology can also be used to propel research in assistive technology for all blind animals.

Currently, existing solutions include the halo harness for dogs and cats, and furniture padding (such as bubble wrap or table edge protectors). The halo harness is deficient because, according to amazon reviews for the halo harness, there are not enough sizes of the harness and dogs are not one universal size. Therefore, the harness is too small, too big, or too heavy, and unfortunately, the halo itself may break easily after some use. Furniture padding may be sufficient, but owners will always have to have bubble wrap on every corner of every wall, table, chair, and more. Everytime the padding or bubble wrap falls off from impact or wear, owners will have to put it back again and again. And in outdoor environments, animals will be less safe without good precautionary measures. There is one device we found, called BlindSight®, which uses echolocation to tell the dog where obstacles may be. A study (https://nrl.northumbria.ac.uk/id/eprint/50914/1/Blind_dogs_need_guides_too.pdf) showed that smaller dogs did better in a maze with the Halo than the BlindSight device, while larger dogs did better with the BlindSight device. Our aim will be to make an improved prototype that can be effectively adaptable for animals of multiple sizes, and we want to explore using proximity sensors to achieve this goal. We hope with our solution, blind animals can be supported indoors and outdoors.

Our preliminary approach will be to make an assistive, wearable prototype for blind dogs, so that we have a specific animal to start with. We hope to expand this research for all blind animals in the future if possible. Our first step is to gather information about existing research and development in this field of assistive technology for blind dogs. We will search keywords such as assistive technology for blind animals, animal perception, animal cognition, sensors for blind animals, and sensors for navigation. After gathering information and having a list of specific needs that we need to address, we will proceed with developing prototypes. As our goal is to assist in navigation, our prototype would include sensors and buzzers. Our immediate goal would be to test and understand what works and aligns with the goals we set for the technology. With a

more improved design and version of the prototype, we wish to conduct user studies to gather feedback and further improve the design.

Since we aim to make a prototype, we will complete the IACUC application.