

# Developing technologies to ensure the welfare of dogs remotely, that can be easily used by the elderly and vulnerable

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## Introduction

### Abstract

During the pandemic pet ownership has soared. However, those who gain the most from pets have, during the pandemic, been the least likely to be able to access them. This research covered the development of a system that allows the elderly and vulnerable to remotely interact with pets, to the benefit of both the human and animal user. As such the application merges and draws from Human Computer Interaction (HCI) and Animal Computer Interaction (ACI).

### Prior Research

1. Pons et al. explored remote interaction between hospitalised children and dogs in a day-care, found both the animals and children were highly receptive, however some of the children struggled to use the system [1]
2. Lonely Dog@home allowed dog owners to interact with their dogs remotely however, human users found the interface difficult and dogs found the AI generated voice used by the app distressing

## App Development

### Development of animal-side of the system

The Sphero Bolt [2] was chosen as the initial prototype toy.

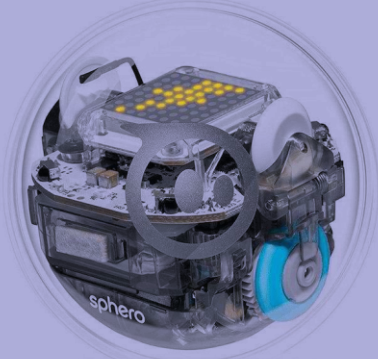


Fig 1: Sphero Bolt

Observations of dogs playing with the Sphero Bolt revealed the following:

1. Appears too robotic
2. Too loud
3. For some pets the ball is not interesting

To address these issues the following modifications were made to the ball:

1. A rubber cover was purchased to encompass the ball to give a more stereotypical pet toy appearance, this cover also helps insulate the sound
2. A toy was attached to the case and dragged around as the ball moved



Fig 3: Final prototype toy

### Development of human-side of the system

The human-side consist of screens made up of only a few buttons, each of which have their functionality described by text. Different parts of the interface are clearly separated by a clear colour scheme:

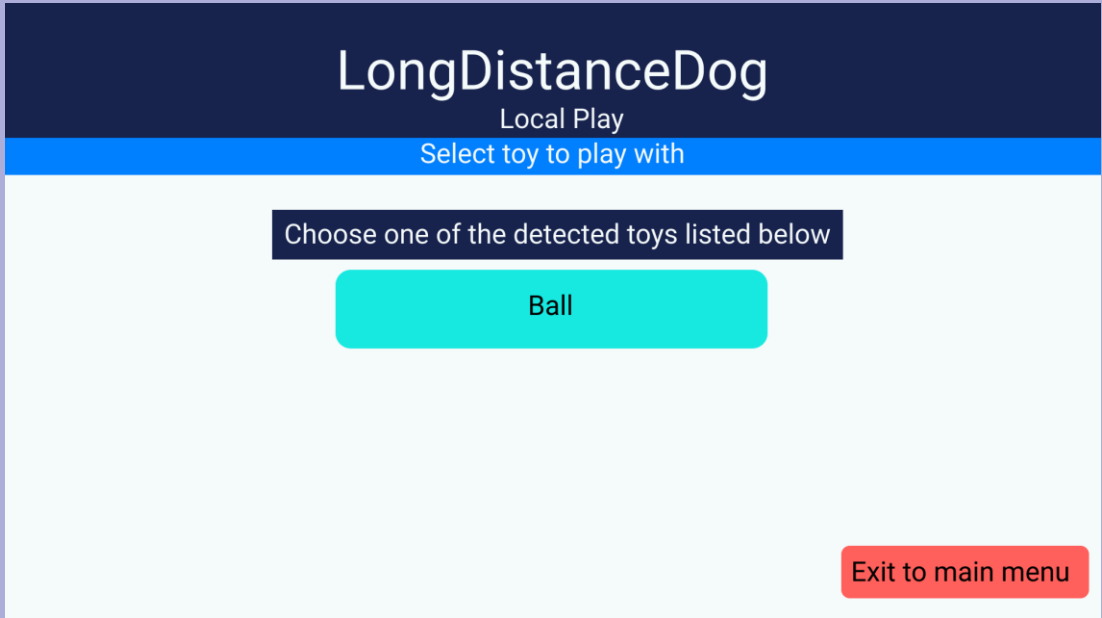


Fig 2: App screenshot

The app supports a wide-array of inputs for any action a user may want to perform including controlling the toy. Some of the control options the app supports includes:



Fig 4: Joystick



Fig 5: Buttons



Fig 6: Game controller



Fig 7: Dog playing with the toy



Fig 8: Cats also enjoyed playing with the toy

## Evaluation and next steps

The system produced provides a basis through which vulnerable individuals could interact remotely with pets using a variety of inputs according to their unique needs. For further progress to be made the system now needs to be tested with human users in-order to get their feedback, these results could then be used to kick off a series of user-centred design iterations. Some future steps could include:

- Adding push notifications; the ball has been programmed to detect collisions, so push notifications could be sent to human users when the pet appears to be interacting with the ball
- Making more toys compatible with the app
- The app could work with other developments in remote pet interaction, such as Companion [3]
- Researching the settings which would be best for deploying the systems for the animal user

References:  
[1] <https://bit.ly/2YUYW8P>  
[2] <https://sphero.com/products/sphero-bolt>  
[3] <https://joincompanion.com/>