

## Goal

- ❑ Develop an accessible Augmented Reality Mobile Application that desensitizes phobia patients with animal phobias through exposure therapy.
- ❑ Track patient anxiety and comfort through each intensity level and provide analytics to observe therapy effectiveness.

## Motivations and Objectives

### Motivations

- Estimated 8.7% (~19.2 million) Americans are affected by a specific phobia.
- Phobias can be crippling causing unpleasant symptoms such as heart palpitations, perspiration, dizziness, dry throat.

### Objectives

- Design and Develop protocols that use augmented reality and gradually expose patients to stimulus.
- Track session analytics to observe effectiveness of therapy.

## Research Challenges

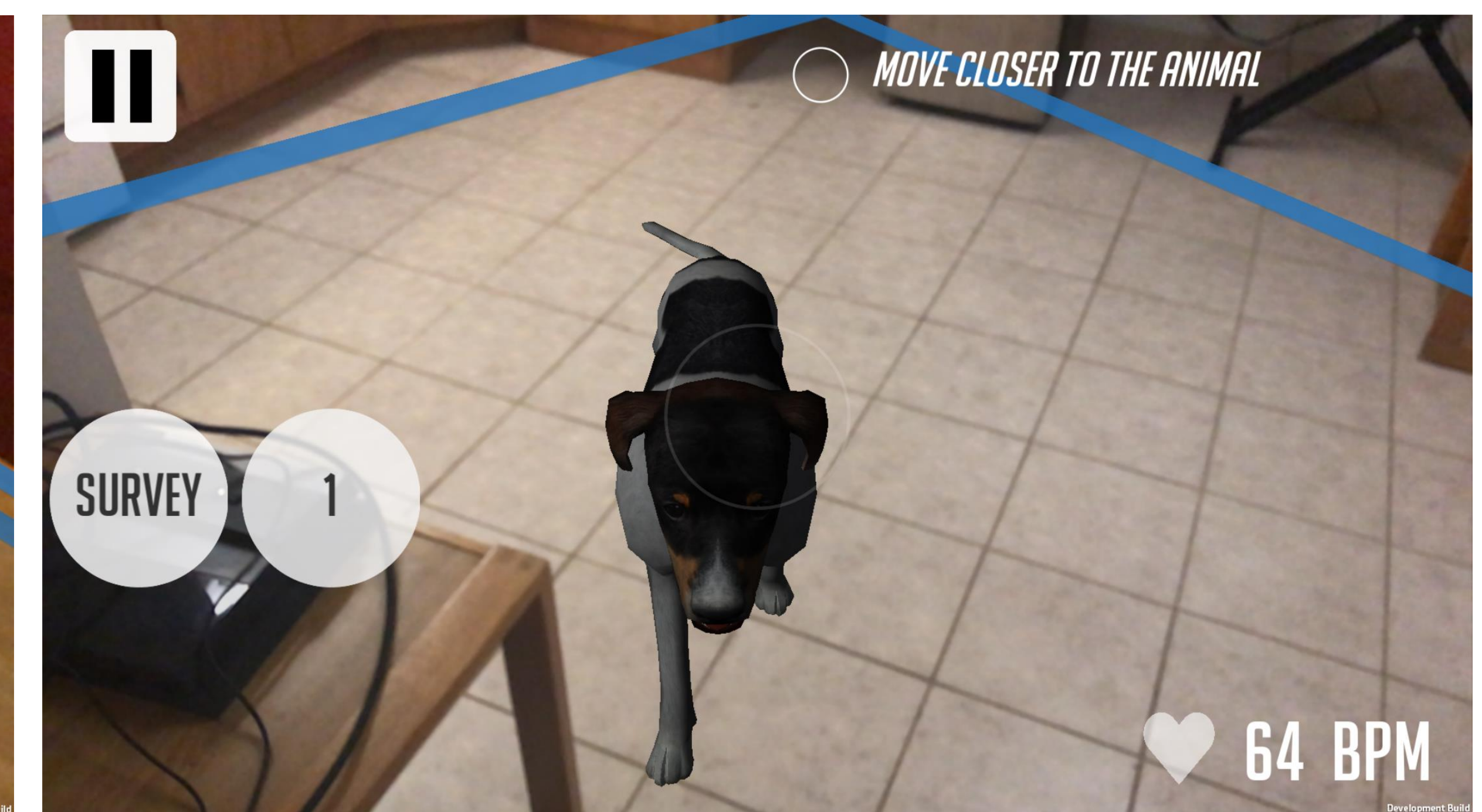
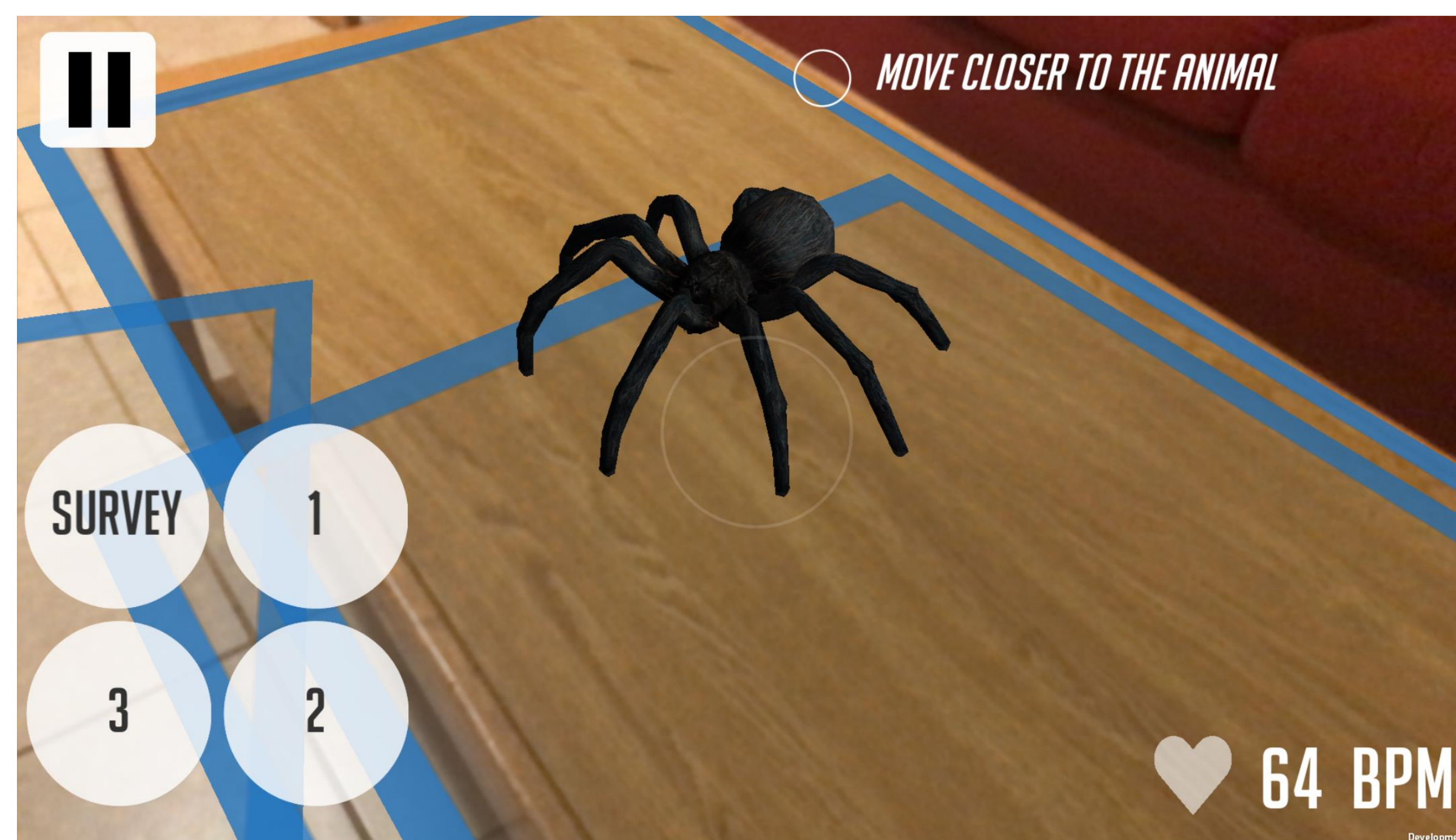
- ❑ Lack of real patients to study feasibility and usability for the effectiveness of the therapy.
- ❑ Gathering patient metrics from each session without the use of external equipment.
- ❑ Infant AR tracking can be susceptible to noise which causes improper screen to world mapping.

## Acknowledgement

We would like to thank Dr. Deborah Silver for providing valuable insight, and the Electrical and Computer Engineering Department for the resources and support.

## Methodology

- ❑ Protocols with several intensity levels were designed for each specific animal phobia that gradually expose the stimulus to the patient.
- ❑ The patient chooses an animal to work with and chooses an unlocked intensity level.
- ❑ The user performs tasks to complete the level and completes a post-session survey.
- ❑ If session metrics surpass a certain threshold, the patient can move on to the next level.
- ❑ Analytics and progress can be viewed on the analytics page.



## Results

- ❑ Patients can choose an activity to work with.
- ❑ Patients can choose a difficulty based on progress.
- ❑ System checks if metrics pass a threshold to allow them to progress to next level.
- ❑ Patients can view their analytics after multiple sessions.

## Future Direction

- ❑ Implement common phobias/disorders that VR/AR can combat.
- ❑ Develop external medical devices that measure temperature/perspiration/breathing.
- ❑ Perform usability and feasibility trials and continuously iterate on patient feedback.

## References

- [1] Armfield, M Jason (2007) Understanding animal fears: a comparison of the cognitive vulnerability and harm-looming models: *US National Library of Medicine National Institutes of Health*. Retrieved from <http://ncbi.nlm.nih.gov>
- [2] Davis, E. Thompson, Ollendick, H. Thomas, Ost, Lars-Goran (2010) Intensive Treatment of Specific Phobias in Children and Adolescents: *US National Library of Medicine National Institutes of Health*, Retrieved from <http://ncbi.nlm.nih.gov>