

## Abstract

- Wachusett Vineyards in Hubbardston, MA faces challenges keeping pests out of their crops
- System provides a safe way of deterring birds by identifying them and playing predatory audios

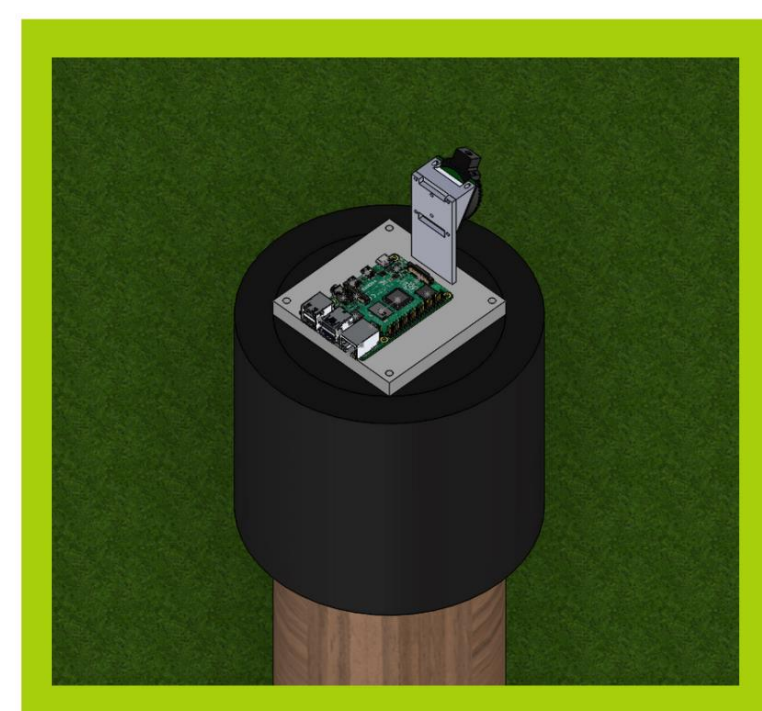
## Background

- Wachusett Vineyards in Hubbardston, MA faces challenges keeping pests out of their crops
- Pests such as birds, deer, and insects can reduce crop yields in vineyards by 45% [1]
- Methods such as netting can be expensive to implement



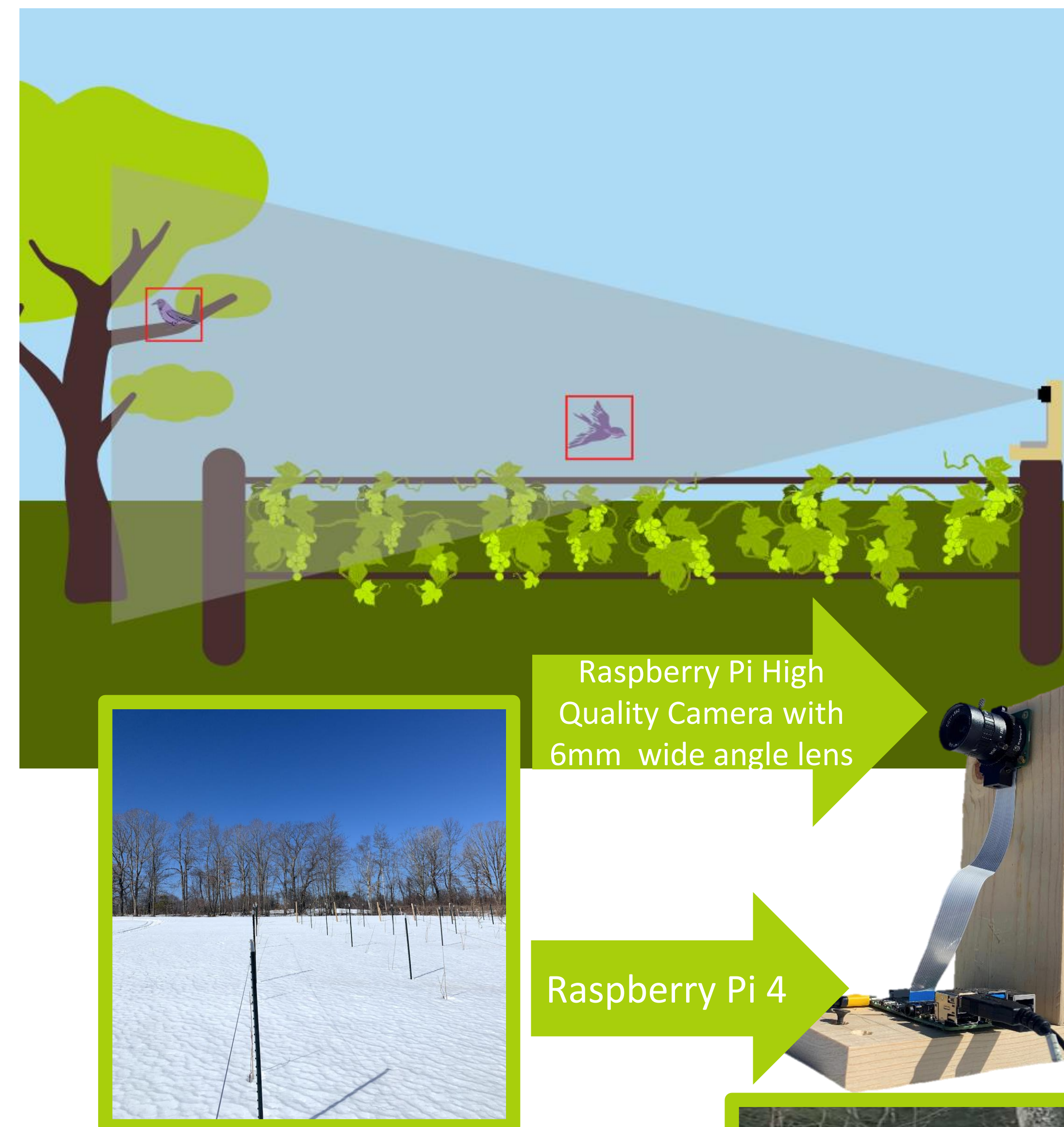
## System Concept

- The system records a live stream of the vineyard and implements a motion detection library
- If motion is detected, a notification is sent to the application and is recorded on the event log
- After motion is detected, an audio response is triggered



## System Implementation

- Initial Solidworks plan using 3D printed base
- Camera implements Motion Library to identify birds
- Movement triggers one of four predatory hawk audios
- Events are recorded on application and in database



## Motion Detection

- System implements "Motion Project" library to detect birds
- Inputs such as threshold and framerates were adjusted in testing to improve accuracy
- Testing was conducted at the vineyard and in local wooded areas



## Computer App

- Main page allows for livestream of the vineyard
- Settings page allows users to manually play audios in the field and can adjust the pitch and speed
- The event log captures images of each "motion event" which is accessible on a database



## Conclusion

- System can be secured on vineyard posts
- Motion library identifies bird movement
- Motion events trigger various hawk audios
- Computer application allows for monitoring and controlling the system

## Acknowledgements

We would like to thank our Advisor Professor Michael Gennert for his guidance and support throughout our project. We would also like to thank Pamela and Brion Keagle of Wachusett Vineyards for their help and allowing us to test our system in their vineyard.

## References

[1] J.P. Tracey and G. Saunders, "Damage to the Wine and Grape Industry," Report to the Bureau of Rural Sciences, Department of Agriculture, Fisheries, and Forestry, 2003.

## Credits

1. <http://www.my-grape-vine.com/blog/bird-damage-on-grapes/>  
 2. <https://wineindustradvisor.com/2020/07/13/repel-pest-birds-from-your-vineyards-with-amazing-results>  
 3. <http://wineguy.nz/index.php/glossary-articles-hidden/164-bird-damage-in-the-vineyard>