

Autonomous Paddock Mucking Robot



Longhopes Donkey Shelter

Client Contact: Kathy Dean, President

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Background Information

Located in Bennett, Colorado, Longhopes Donkey shelter was founded in August 1999. Kathy Dean and her husband Alan Miller have an unwavering passion to rescue unwanted donkeys, often destined for slaughter. Kathy recognized the need for a dedicated facility where donkeys could receive rehabilitation and training until suitable homes were found. A testament to their dedication, Longhopes became the first donkey shelter in the United States to be accredited by the esteemed Global Federation of Animal Sanctuaries. This prestigious recognition affirms their adherence to the highest standards of animal care and welfare. A critical component of humane animal care is keeping their environment clean of excrement. The donkey paddocks require daily attention to remove manure.

Project Goal

If you like to play with robots, this project is for you!

The ultimate goal is an autonomous paddock mucking robot. The robot is a combined effort of CSCI 370 and EDNS 490/491 Capstone students. A robot equipped with NVIDIA Jetson ROS operating system, LiDAR, GPS location and cameras is built to traverse the paddock, identify and pick-up and deposit manure in a specified location.

All the systems were built independently, and upon integration, optimization is required.



Summer 2025 CSCI 370 Objectives

- Optimize the autonomous robot operation
- Pathfinding algorithm
- GPS location algorithm
- AI trained to identify manure
- Optimize maneuverability of robot
- Optimize software mechanism for picking up and delivering manure
- On-site visits to become familiar with the paddock environment
- At the end of the field session, all software systems should be optimized and the robot ready for deployment in an autonomous operation.

Suggested Skills:

- C++
- ROS

Suggested Review:

<https://longhopes.org/> – client website