



Development of a Helical Path Tree Climbing Snake Robot



Sponsor

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Team 10

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Advisor

Dr. Jonathan Clark

Aim: To develop a remotely operated, helically climbing, modular snake robot that will carry a payload for future iterations.

Project Background

- The current process of removing large trees is very expensive and dangerous.

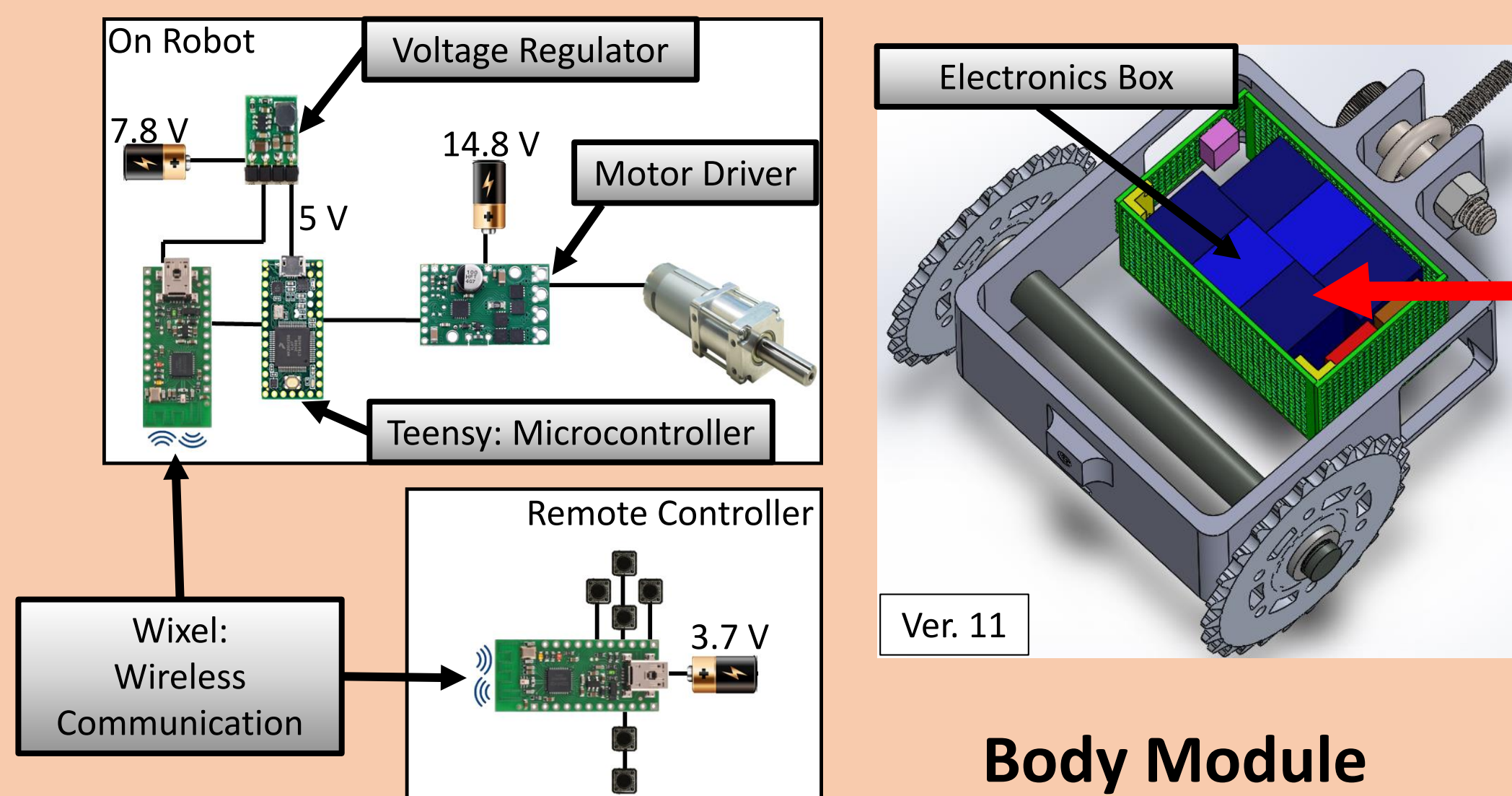
Objectives

- Able to climb a tree diameter of 10-30 inches
- Ascend at a minimum speed of 1ft/min
- Carry a payload of at least 10lbs
- Remotely operated
- Provide video feedback via a camera

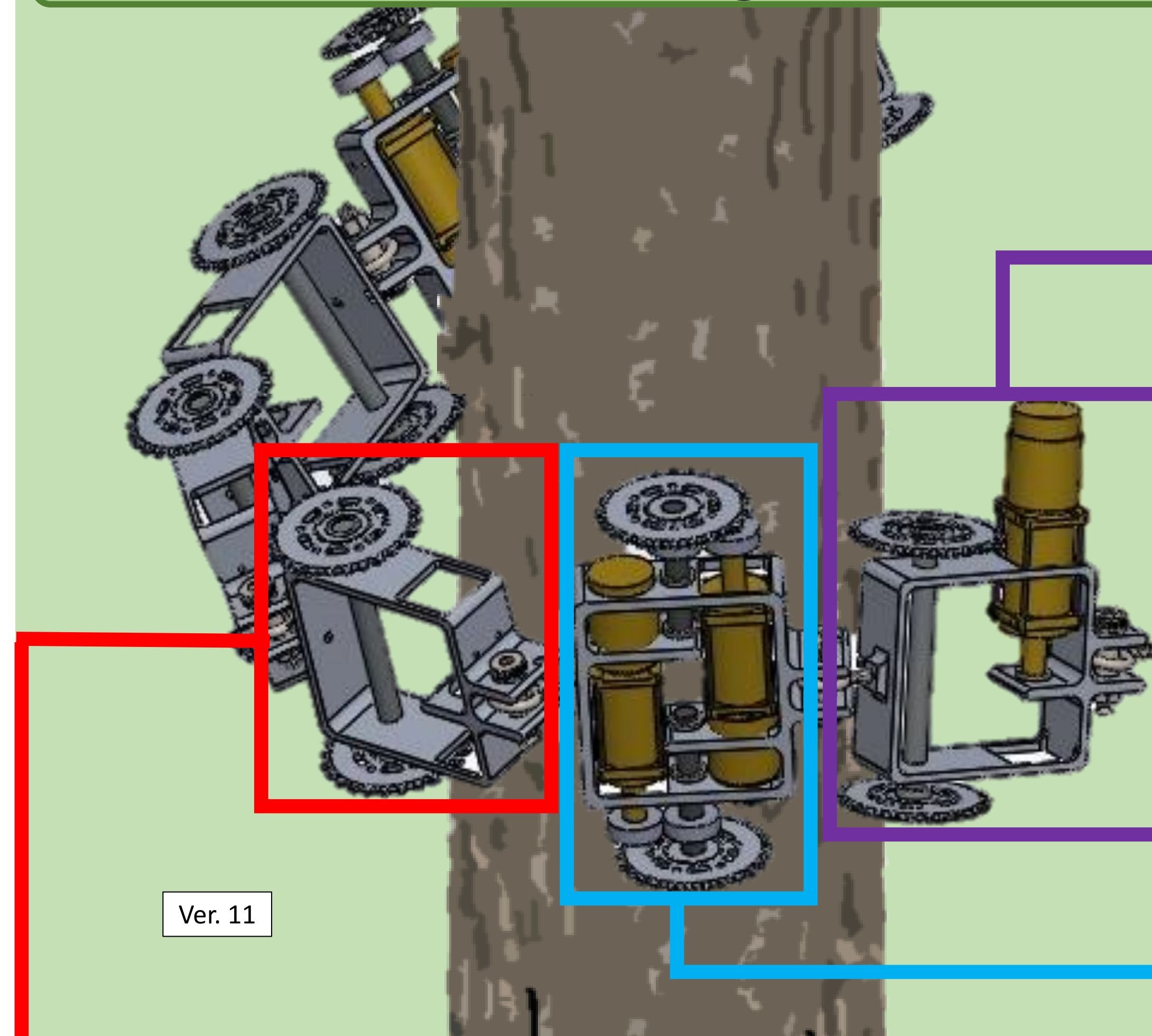
Results



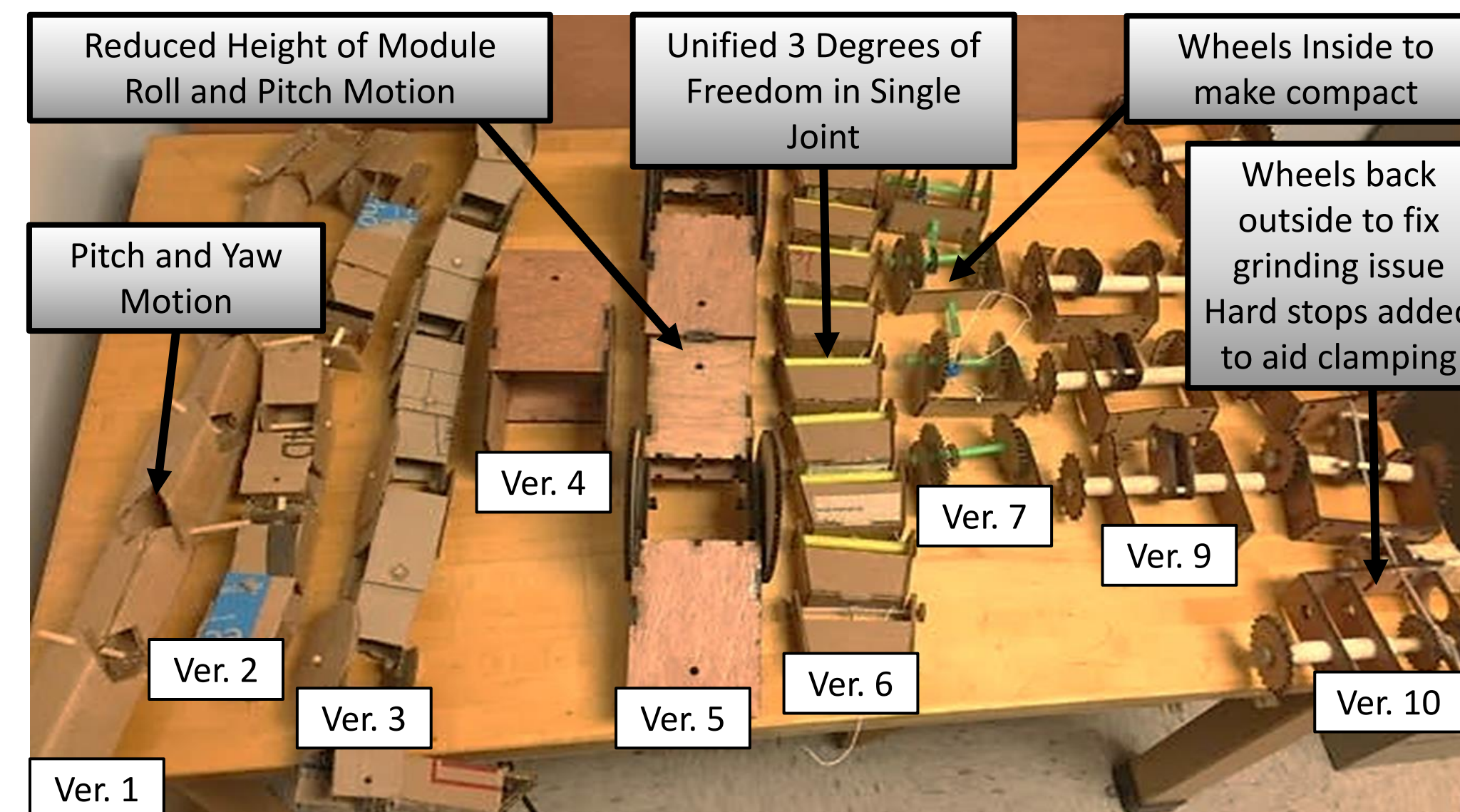
Electronics



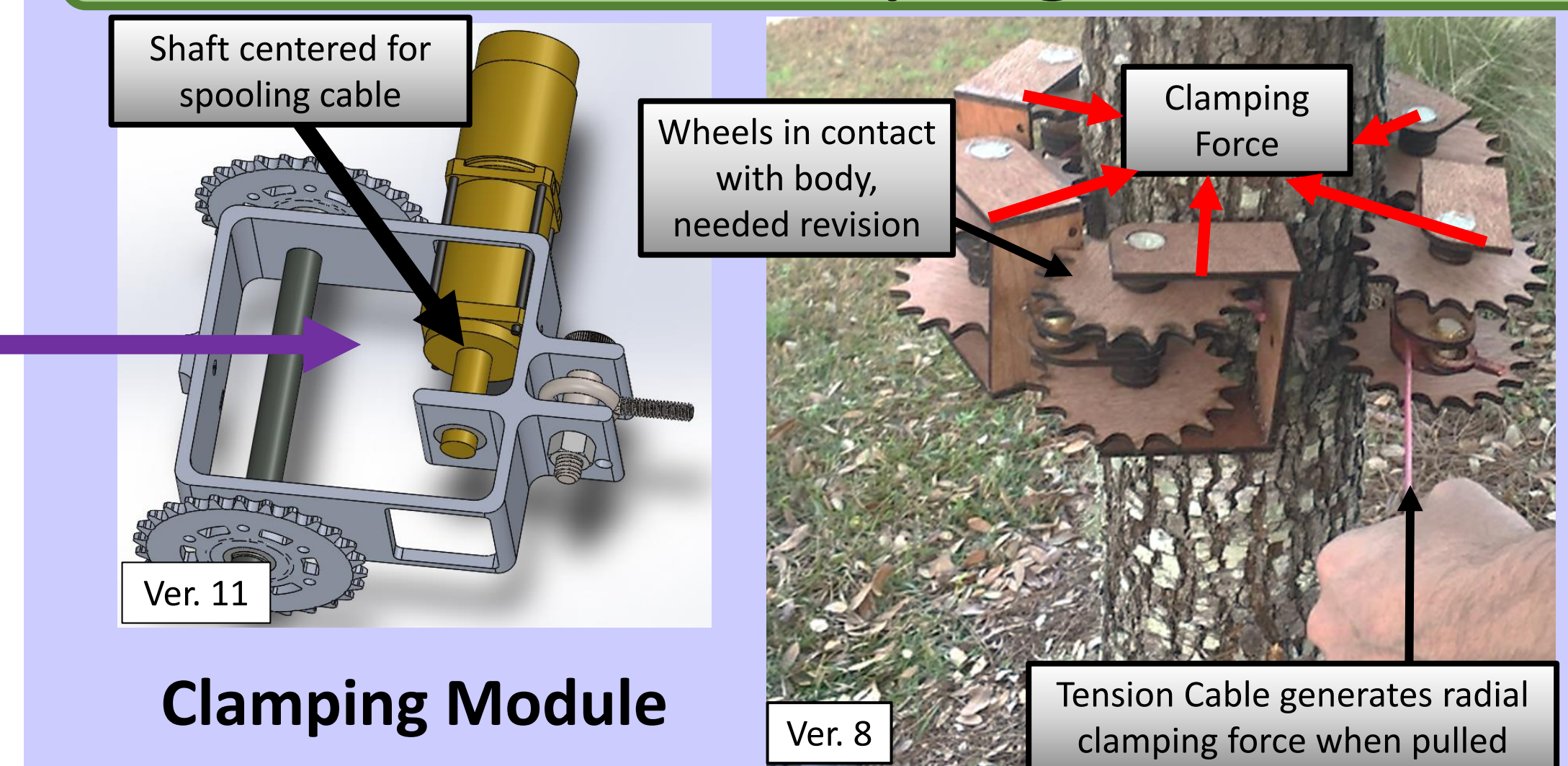
Final Design



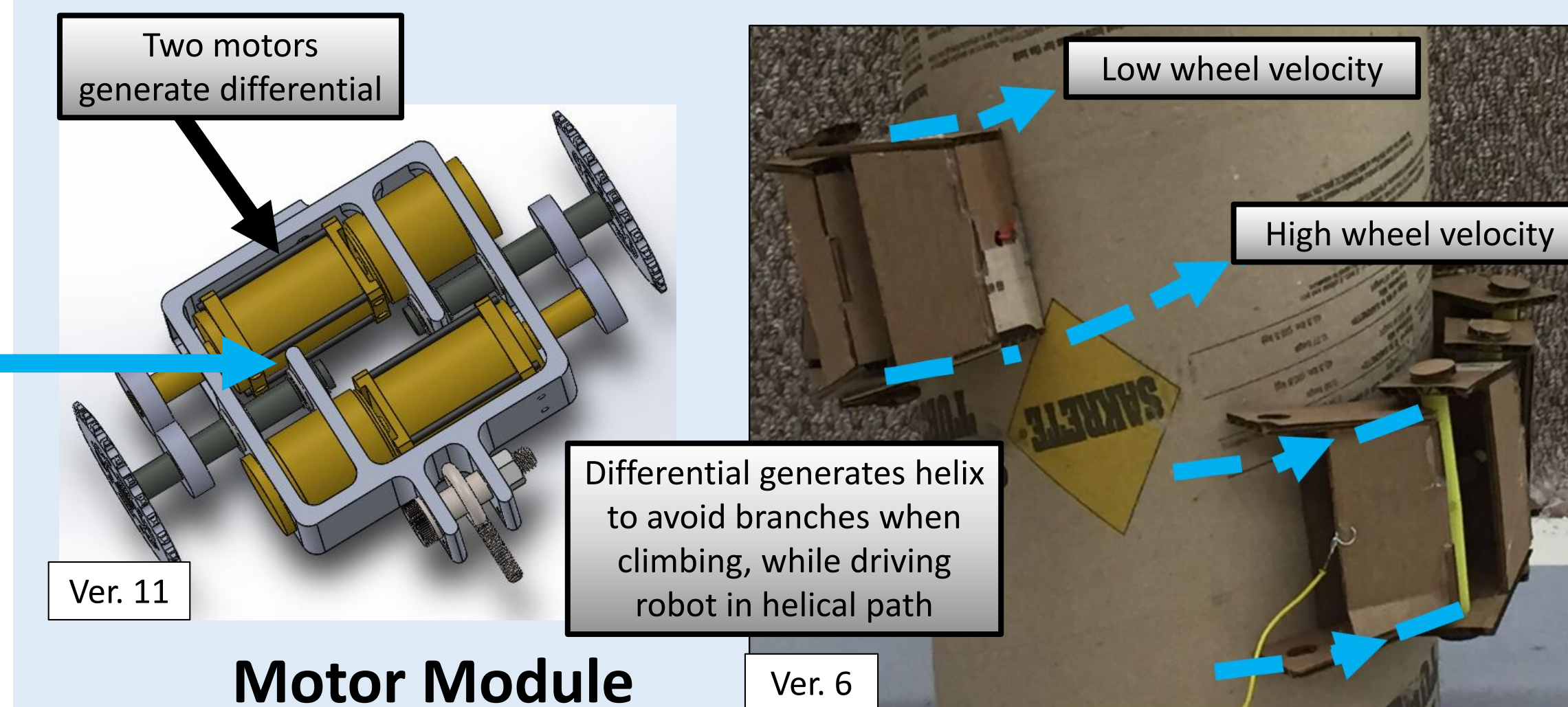
Prototype Progression



Clamping



Helix



Conclusion

The design was proven successful by testing the clamping and helical generation— required for climbing the tree— individually

Early testing shows the clamping being able to hold at least 10lbs of force. The differential also showed promise in generating a helix, however, traction was not sufficient. Further testing is required, by increasing clamping force and using stronger drive motors.

The team has learned that motor selection is key when designing a robotic snake. Motor weight and size affected overall design.

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