The Gopher Tortoise Scope

Sponsored by

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The Tall Timbers Research Station and Land Conservancy

In partnership with

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TALL TIMBERS
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COLLEGE OF ENGINEERING

Overview

- Status update on subsystem design
  - User interface
  - Tether
  - Rover
- Project management
  - Part acquisition
  - Scheduling
  - Budget

Background

- Tall Timbers researches the gopher tortoise
  - Keystone species
  - Burrows average 6 m long (maximum of 15 m)

- Goal is to enhance capability of taking population surveys with an improved scoping mechanism

Rover Materials

- Permanent Parts
  - IR LED camera
  - Durable tracks [1]
  - Motor drivers
  - Aileron mechanism
  - Monitor
  - Arduino Micro
  - Raspberry Pi B+
  - Gamepad

Communication

- Successful
  - Gamepad → Raspberry Pi B+
  - Raspberry Pi B+ ←→ Arduino Micro
- Progressing
  - Camera → Raspberry Pi B+
  - Gamepad → Arduino Micro via Raspberry Pi B+
  - Arduino → servo and motor drivers
  - Temp/humidity → Raspberry Pi B+ via Arduino Micro

Tether

- Electrical wiring
  - RCA
  - Active USB
  - 10-gauge speaker wire
- Kevlar sheath
  - Weather and abrasive contact durable
  - Lightweight (0.21 kg for 15 m) [2]
- No steel guide wire
  - Slack on wires inside body
  - Stops on wires and sheath

Camera Movement

- Simplified design
  - Aileron system
  - Panning only
- Justifications
  - Wide angle lens
  - Simpler mechanism
  - Less space
  - Servo motor

Casing

- Permanent parts
  - 1/8 inch Plexiglas
- Construction
  - Laser cut
  - Adhere with silicone sealant
  - L-bars
  - Removable top

Part Acquisition

- Purchased over break
  - 10-gauge speaker wire
  - Monitor
  - 25W/3A DC volt converter battery regulator
  - USB Hub for Raspberry Pi B+
  - Durable tracks
- Need to be purchased
  - Tether components
  - Battery

Scheduling

- Progress has slowed
  - Material acquisition delays
  - Group organization difficulties
  - Feasibility of components
  - Re-evaluating product needs
- Mitigations
  - Split into subgroups
  - Communicate with advisors
  - Assess meeting activities and time

Budget

- Still over 70% of budget available
- Spending changes
  - Invest in more expensive parts
  - Final components
  - Allocate 20% to prototype testing

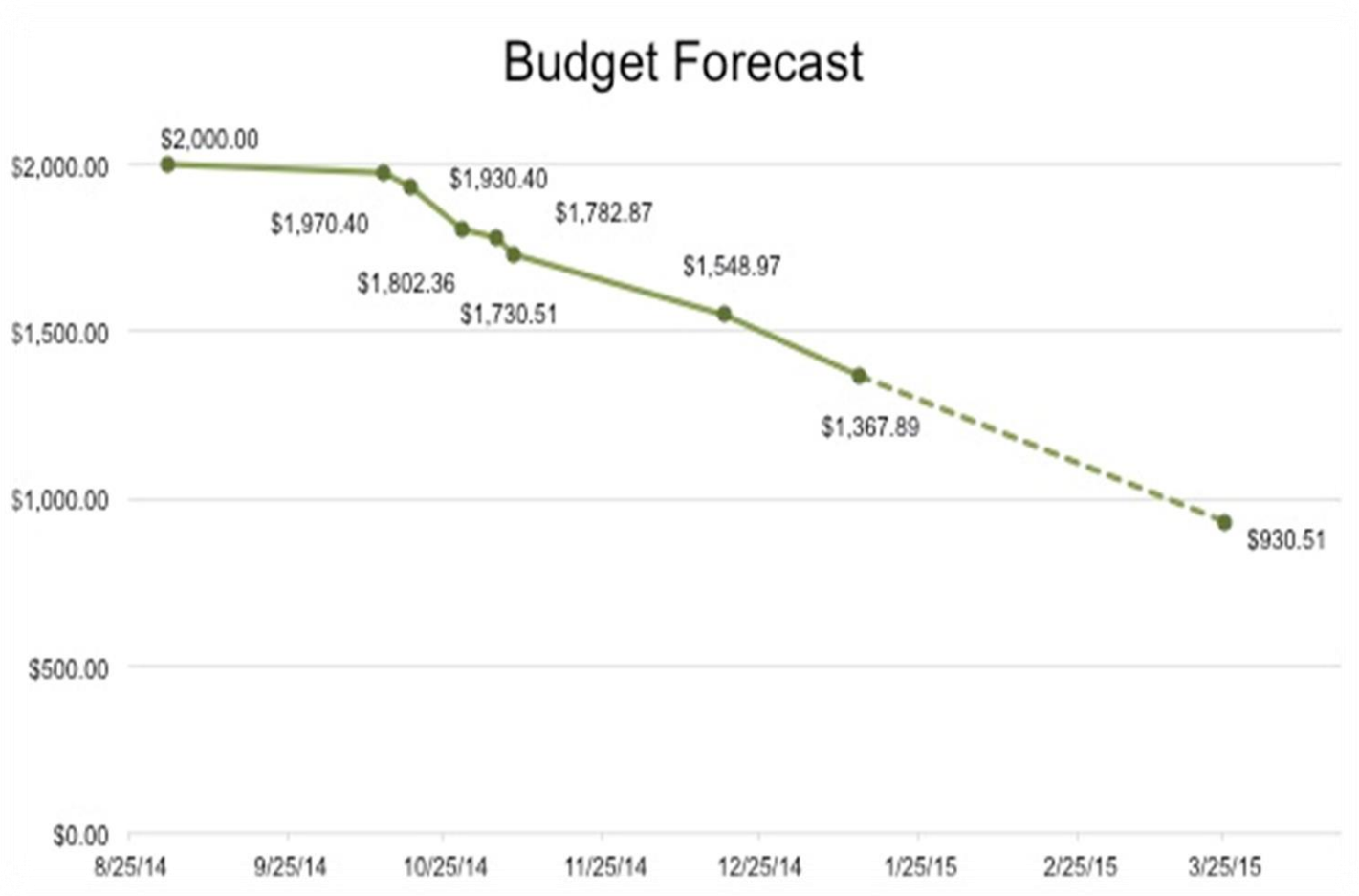

Figure N: Burn Chart

Conclusion

- Progress on the rover:
  - Parts acquired
  - Communication progress
  - Camera movement
  - Casing and tether design
- Future work for the final product:
  - Budget and schedule planning
  - Determine assembly specifics

References

1) "Lynxmotion Track - 2" Wide x 21 Links ~23" - TRK-01." Mechanics, RobotShop, 2015. Web. 16 Jan. 2015. <http://www.robotshop.com/en/lynxmotion-track-trk-01.html>.
2) "Kevlar® (KV) Expandable Braided Sleeving." CableOrganizer. CableOrganizer.com, 2015. Web 16 Jan. 2015. <http://www.cableorganizer.com/kevlar/>.

Questions?

For more information, please visit:

www.eng.fsu.edu/me/senior_design/2015/team21/