



# MOBILITY TRICYCLE: FRONT-END REDESIGN

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- Brief Overview of Mobility Tricycle Project
  - Our Project Goals
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-

# MOBILITY TRICYCLE PROJECT

- Sustainable solution- Locally fabricated, operated, and maintained
- Overall goal is to improve the quality of life for people living with disabilities by restoring their physical mobility
- Work with Center for the Advancement of the Handicapped in Burkina Faso, West Africa



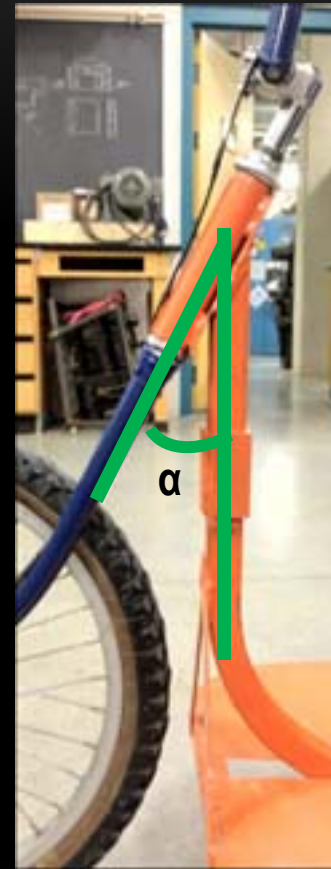
# PROBLEM

- Poor handling and stability
- Difficult to turn
- Wobble



# FRONT END

- Related to problems
- Head tube angle
- Never analyzed thoroughly
- May benefit from a redesign



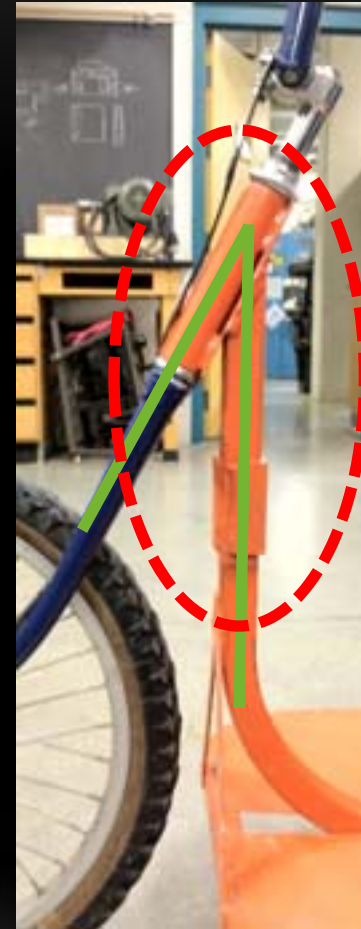
# OUR PROJECT GOALS

- Find Optimum Head Tube Angle to:
    - Minimize Wobble
    - Increase Handling and Stability
    - Implement it on the existing tricycle
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# APPROACH

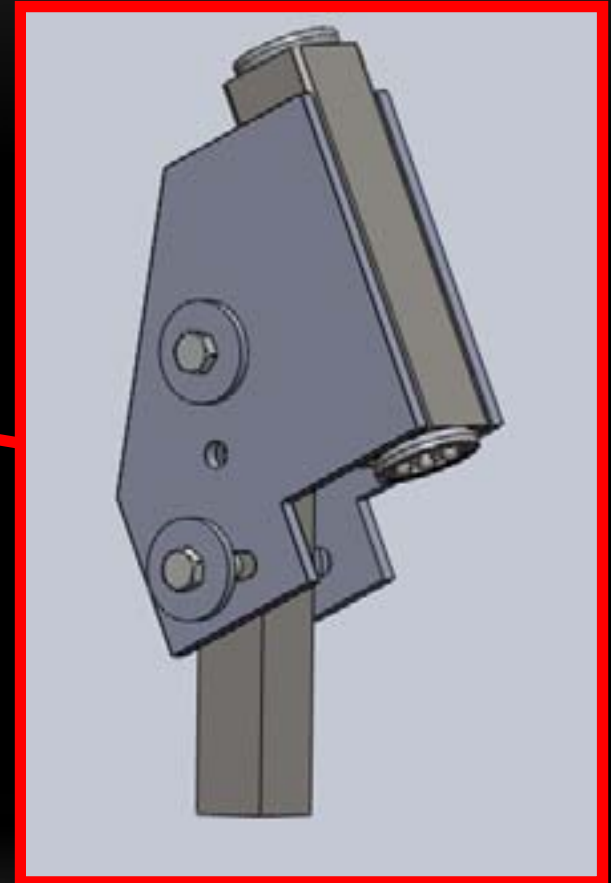
- Design and build an adjustable head tube to allow testing of various angles
- Conduct tests to determine the best head tube angle

# ANGLE ADJUSTER





# ANGLE ADJUSTER



# ASSEMBLY



# FINAL PRODUCT



# TESTING

## **Three Tests**

- Straightening
  - Handling
  - Wobble
-

# STRAIGHTENING TEST

- Ride in a straight line at constant speed
- Measure the force required to stay straight



# SPEED GOVERNOR

Governor

Throttle



# FORCE GAGE GUIDE



Guide

Force  
Gage

# TESTING

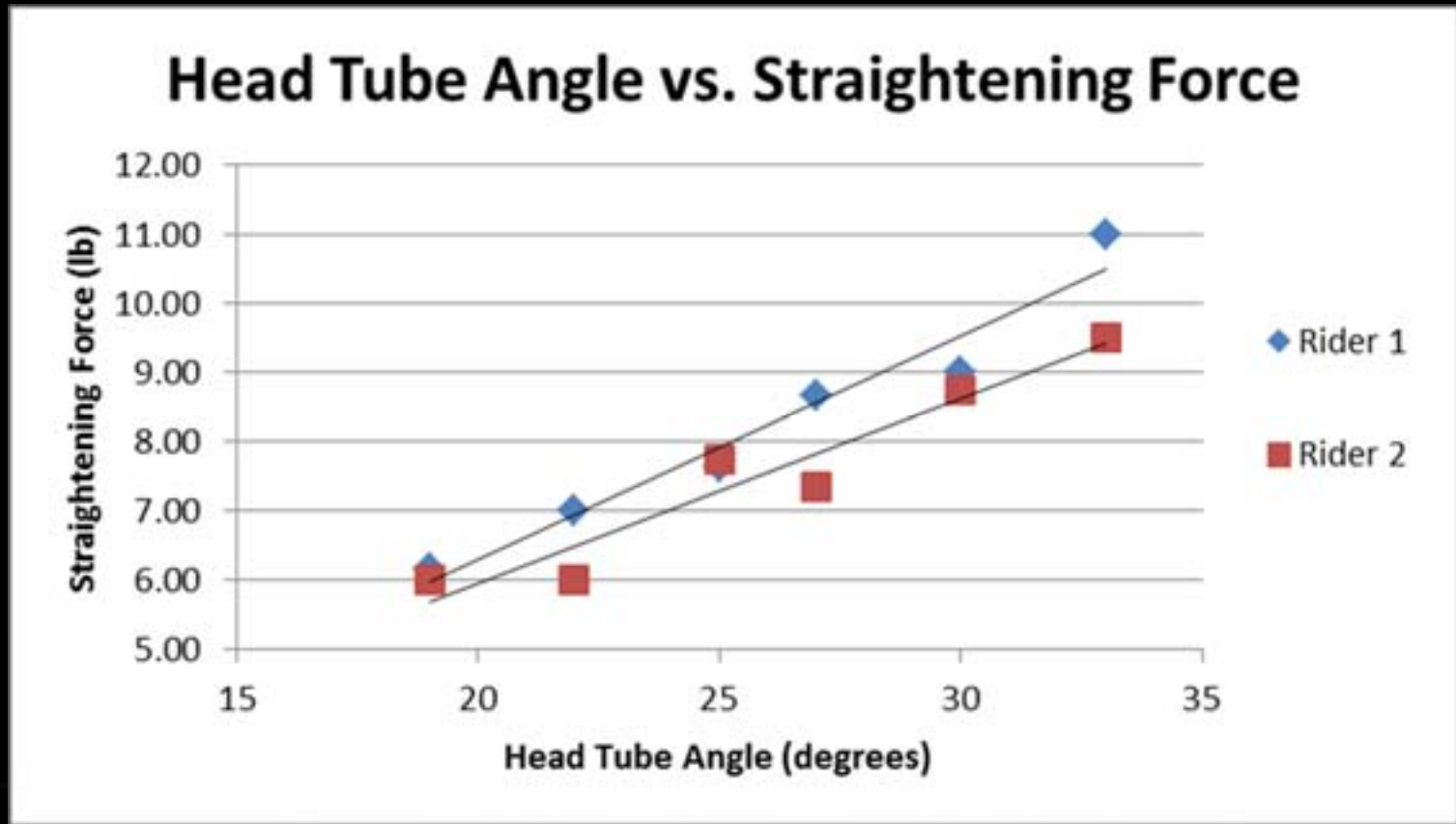


- 7.6-7.9 mph
- Along the path
- Read the gage
- 2-3 trials per person



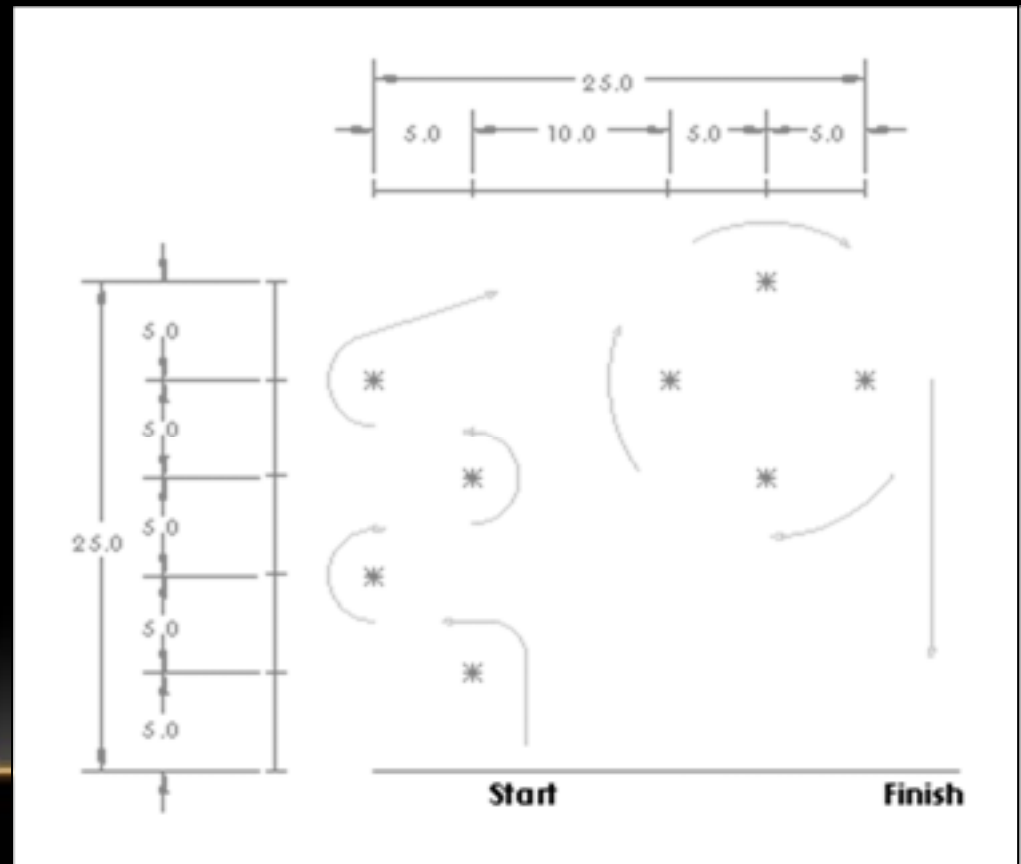
# RESULTS

As the head tube angle increases, so does the difficulty of turning

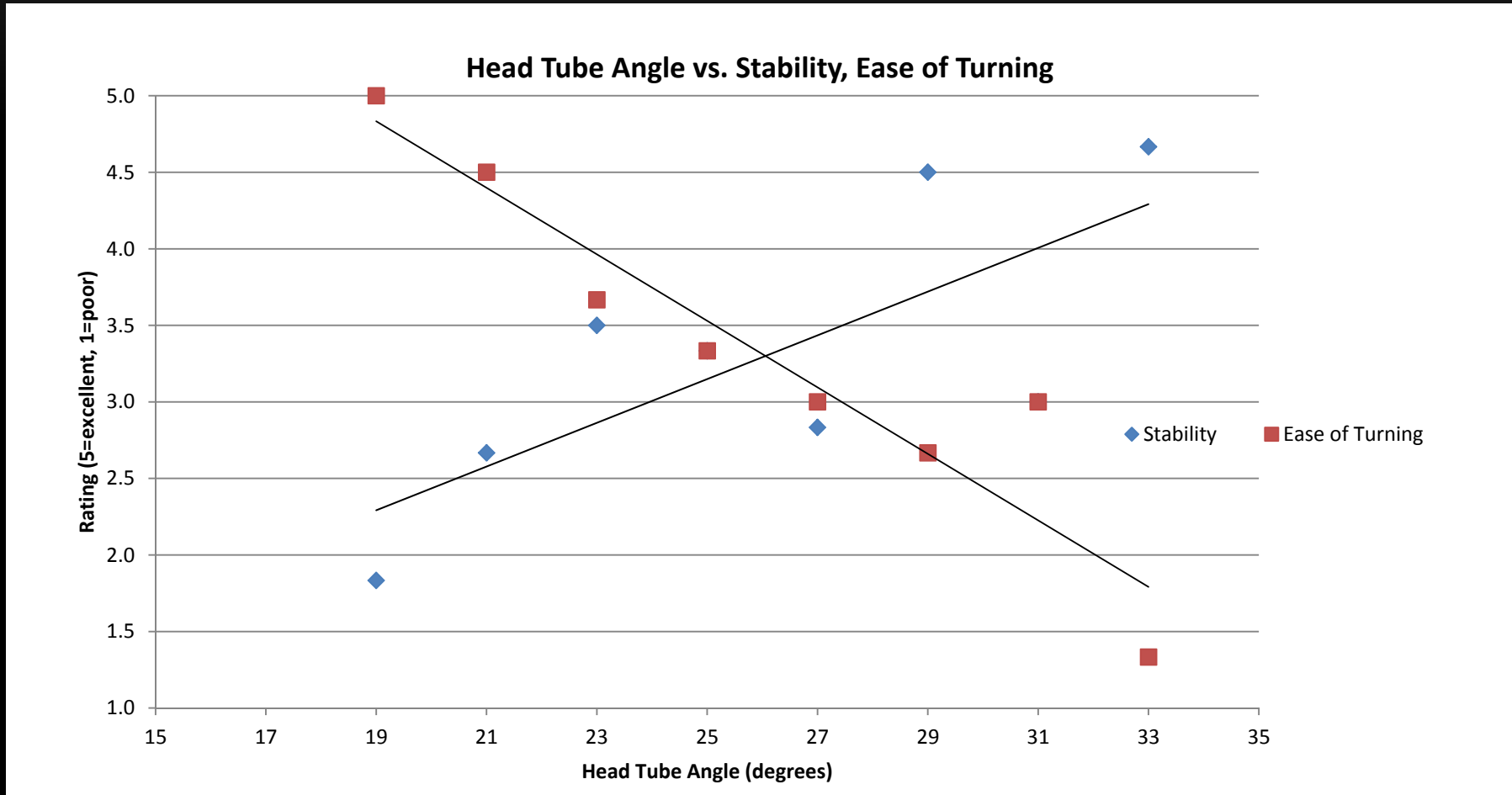


# HANDLING TEST

- Ride through an obstacle course and observe ease of handling
- Qualitative

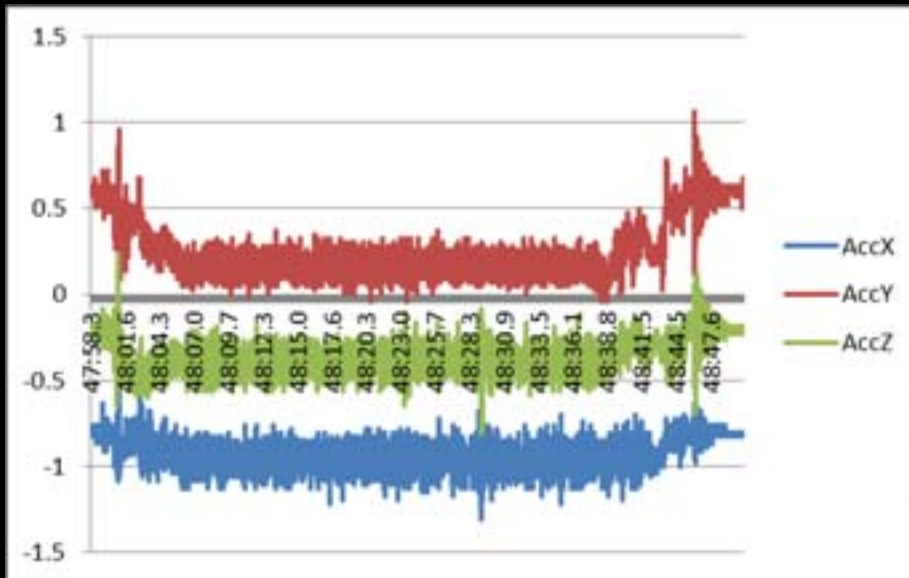


# RESULTS



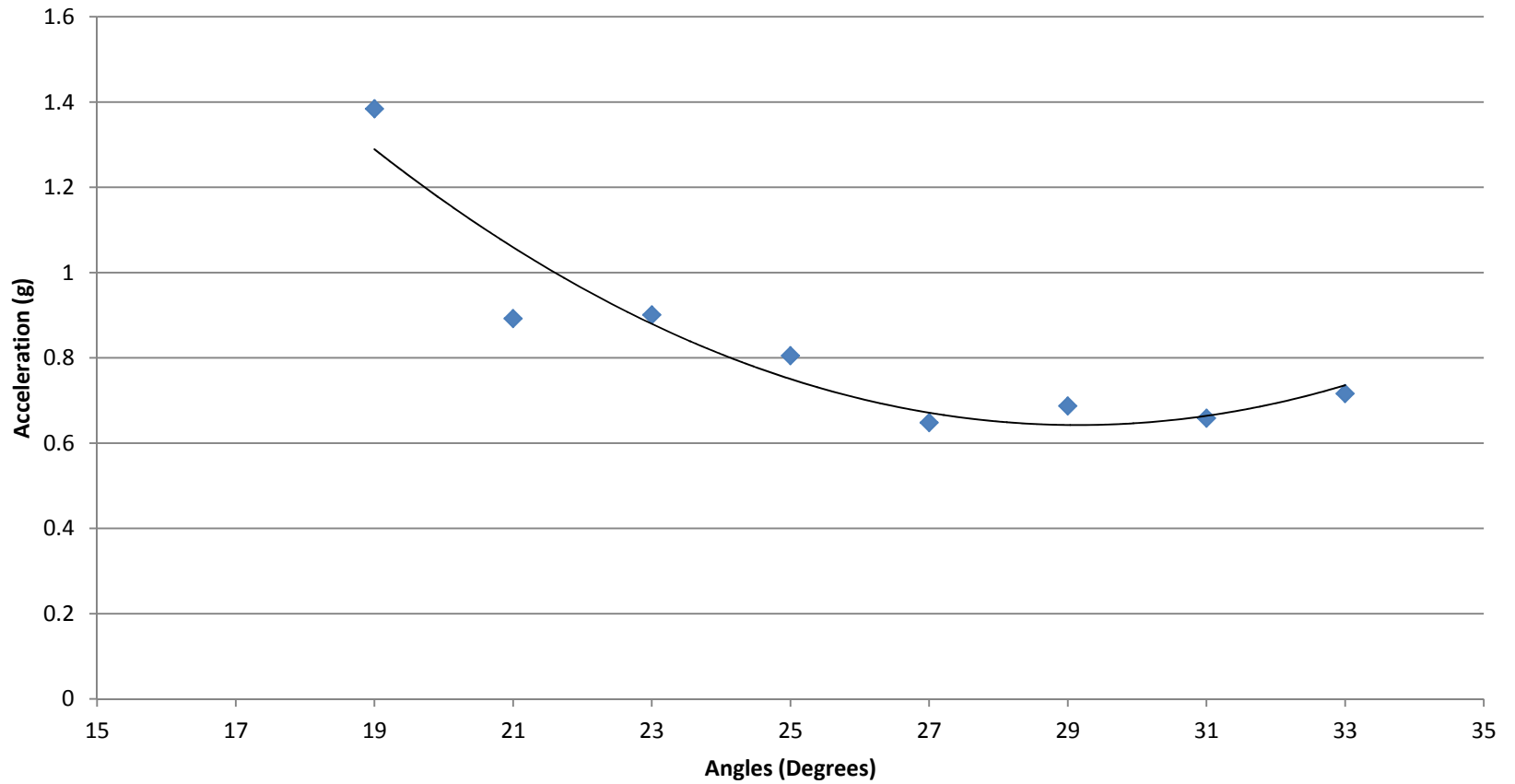
# WOBBLE TEST

- Use the accelerometer in a Wii remote
- Measured the acceleration of the fork at varying angles



# RESULTS

## Wobble




# CONCLUSION

- Stability vs. Ease of Turning
- Recommend staying at 25 degrees
- Able to cater to client

Test	Optimum Angle (Degrees)
Straightening	19
Handling	26
Wobble	33

# FUTURE WORK

- Continue to work on handling and stability
  - Possibly look at :
    - Trail
    - Weight distribution on front end
    - Solid Works model
- 

# ACKNOWLEDGEMENTS

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    - Mr. John Meyer
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    - Taylor Eberly
-



QUESTIONS?