Rotational Equilibrium (Statics)

Equipment

- LoggerPro v3.3
- Force Probes
- Stands, brackets, string, masses and pulley
- Rod with mounting/rotation point

Objective

Data collection

- Set up appropriate experiment to measure tension in supporting string

Data analysis

- Determine the tension in the string as a function of one or more variables
- Graph date with uncertainties
- Compare data to theoretical prediction

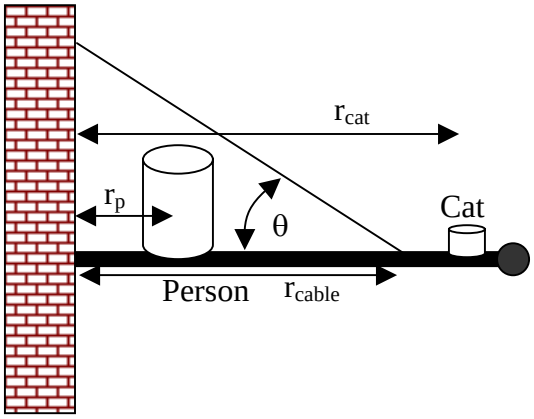
Physics Concepts

- Static Equilibrium

Conceptual (C-Level)

Determine an equation for the tension in the support cable as a function of the position of the movable mass (cat), the cable angle, the position of the variable mass (person) and cable attachment point to the pole.

When is the tension in the support cable a minimum?



Basic Lab (B-level)

Compare experimental results to your theoretical model for the following two cases.

- Tension in the support cable as a function of the movable mass (person) position.
- Tension in the support cable as a function of the cable attachment angle.

Notice changes to your experimental setup that might effect your measurements. Assign realistic errors to all measurements.

Advanced/Extended Lab Ideas (A-level)

- Determine the tension as a function of another variable (like cable attachment point) and compare to your theoretical model.
- Hold one end of a meter stick while the other end rests on a table. Determine the speed of this stick when you let your end fall. Compare to theory.
- What might you be curious to investigate?