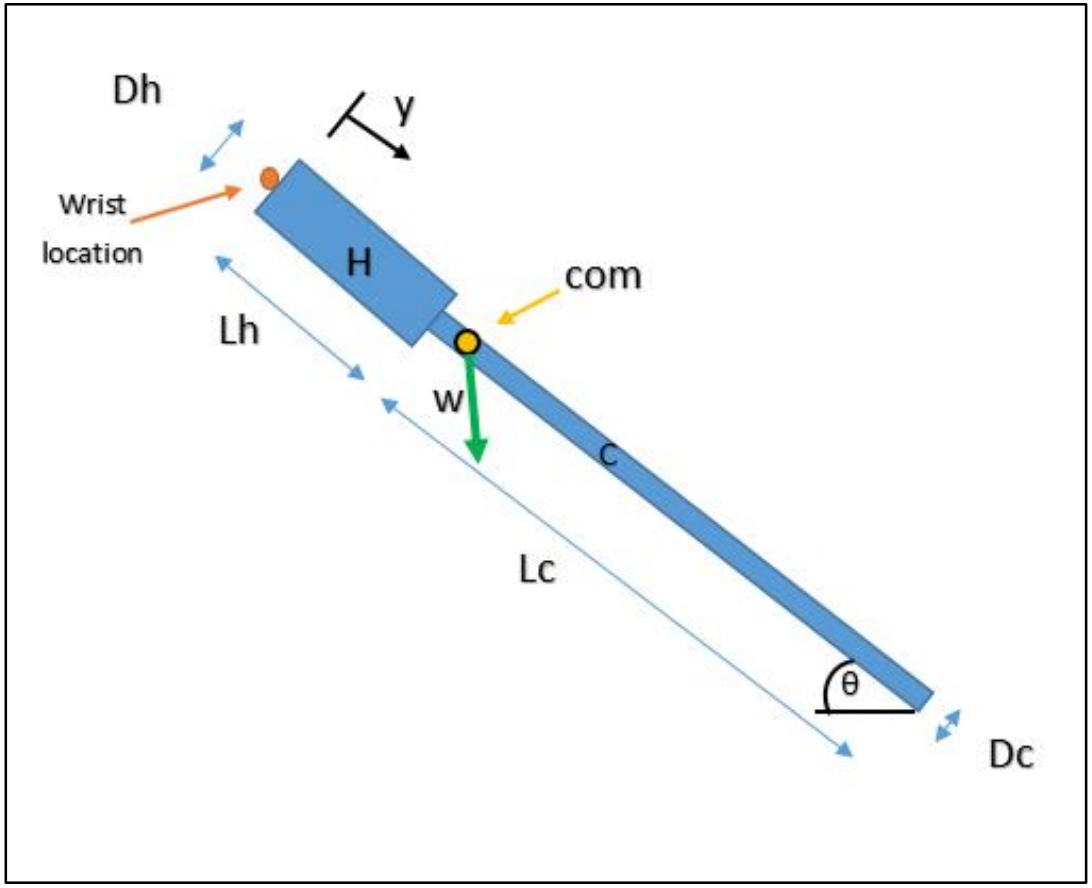
Moment Calculation and Demographic Data



Assumptions
Every cane user holds cane at approx. 46.17 degree angle to the ground
Ideal Cane: Cane handle and shaft are of uniform density
Small changes in cane shaft length result in negligible cane weight change
User is using a graphite cane

Parameters:			
Symbol	**Description**	**Value**	**Units**
Mh	Mass of handle	0.947717	lb
Mc	Mass of cane shaft	0.383604	lb
Lh	Length of handle	11	in
Lc	Length of cane shaft	38	in
θ	Angle of cane to ground	46.17	degrees
Total Predicted Weight for Our Cane		**1.331321**	**lb**
Total Weight of a Standard Cane		**0.5478**	**lb**
Weight Added to Standard Cane		**0.783521**	**lb**
Center Of Mass Calculation (from y)		12.55938	in

	Moment on wrist	-9.67309	lb in
	Metric	1.092907	Nm

CF = (0.0254 m/1 in)*(1 N/0.22481 lb)

Total Weight Estimate of Handle	
Part	W (lbs)
Motors (for 2)	0.0425
3D cane parts (+ approx of sensor	0.365967
Arm	0.034172
PCB	0.027558
Battery	0.102735
Misc. Electrical Components	0.154323
Misc. Mechanical Components	0.220462
Total Weight of Handle	0.947717

Demographic Data (Moment in Nm)					
	μ	σ^2	σ	Probability Density	Percentage that can sustain this
Male	3.78	1.03	1.014889	0.004052415	99.59
Female	2.43	0.74	0.860233	0.060051808	93.99

* Note moment data was collected in a sample of people ranging from 55-85 years old

References:

Nayak, U.S.L, (2004), "Pinch grip, power grip, and wrist twisting strengths of healthy older adults," *The Gerontechnology Journal*, 3(2), From: http://www.gerontechnology.info/index.php/journal/article/viewFile/gt.2004.03.02.003.00/328

Marchini, J., N.D., "The Normal Distribution," From: http://www.stats.ox.ac.uk/~marchini/teaching/L6/L6.slides.pdf