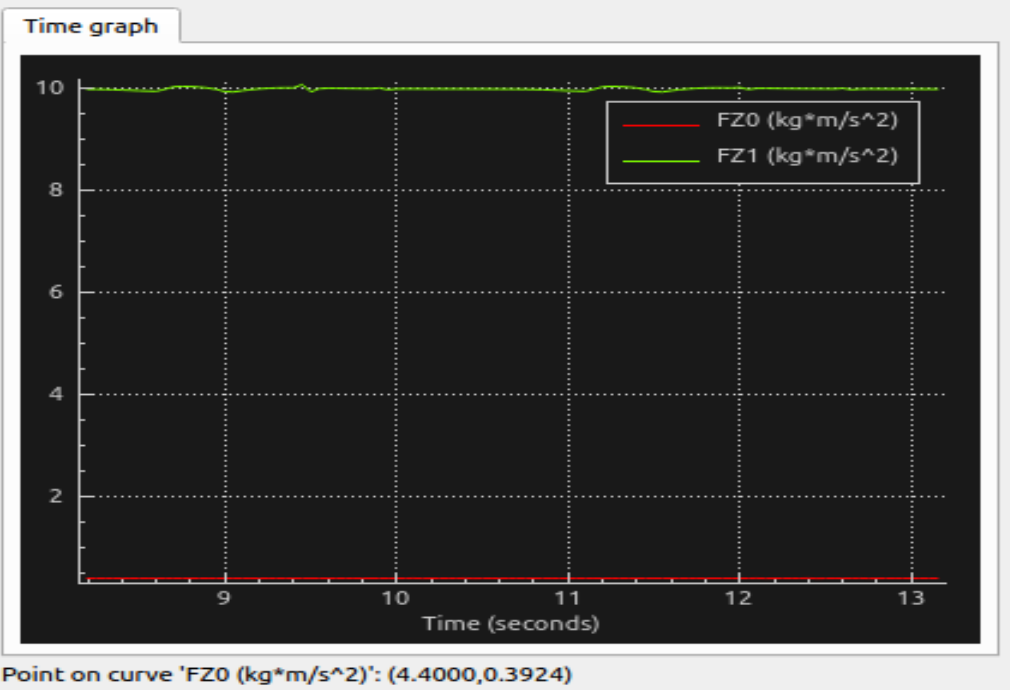
CMU ROBOT AUTONOMY PLUS HW1  
David Wong

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**Q1-3**



Pdes = (10 + 0.14\*9.81 + PID\_D \* prevError \* dt) / PID\_P

Impedence control gains:  
P 150   
I 0   
D 2

Force control gains:  
P 0.05  
I 5  
D 0

**Q4**Beta angle = 30deg

Force controller maintains at 10N force but has larger overshoot (+0.2/-1.5) at the transition from angled surface to flat surface.

Impedance controller maintains constant force throughout motion across transition from angled surface to flat surface.

