

2-2. A 50 kg crate is placed on the ground, and the coefficient of the kinetic friction between the crate and the ground is $\mu_k \sim N(0.3, 0.03^2)$. If the motor draws in the cable with a velocity $v = ct^2$ m/s, where c follows a normal distribution $c \sim N(0.5, 0.05^2)$ and t is in seconds, determine the time when the probability that the cable beaks is 0.05. Assume that c and μ_k are independent, and the maximum tension the cable can stand is $T_{\max} = 500$ N.

Solution: $t = 5.96$ s

