Homework 11

The motion of the collar on the beam *CD* is controlled by a motor at *A*. When the distance between the collar and point *D* is S_1, which follows a normal distribution of $S_1 \sim N(3.5, (5 \times 10^{-2})^2)$ m due to the uncertainty in measurement, the collar moves upward at a velocity of $v_1 = 0.8$ m/s. The length of S_2 also follows a normal distribution of $S_2 \sim N(2.8, (5 \times 10^{-2})^2)$ m. At this instant the allowable velocity of a point on the cable as it is drawn to the motor is $v_a = 0.65$ m/s, use FOSM method to find the probability of the system. Assume that S_1 and S_2 are independent.

(**Ans.** $p_f = 2.825 \times 10^{-6}$)