

you cannot find a closed form solution, you could instead give a technique for approximating the desired values.

- HOLONOMIC
7. A common drive for indoor robots is *holonomic*. A holonomic robot has as many controllable degrees of freedom as the dimension of its configuration (or pose) space. In this exercise, you are asked to generalize the velocity model to a holonomic robot operating in the plane. Assume the robot can control its forward velocity, an orthogonal sideways velocity, and a rotational velocity. Let us arbitrarily give sideways motion to the left positive values, and motion to the right negative values.
- State a mathematical model for such a robot, assuming that its controls are subject to independent Gaussian noise.
 - Provide a procedure for calculating $p(x_t | u_t, x_{t-1})$.
 - Provide a sampling procedure for sampling $x_t \sim p(x_t | u_t, x_{t-1})$.
8. Prove that the triangular distribution in Equation (5.12) has mean 0 and variance b^2 . Prove the same for the sampling algorithm in Table 5.4.