More on Process Models

Later in the lesson I'm going to ask you to read a paper titled "A comparative stud algorithms for maneuvering target tracking" but for now I'd like you to take a look **3.2 only**. This section, titled MM Tracking Algorithms' Design, discusses the 9 proc the earlier part of the paper.

Before you read the section, I'll explain some of the uncommon notation you will s

Notes on Notation

1. Matrix Notation

When you see something like the following:

$$F_{CV} = \text{diag}[F_2, F_2], F_2 = \begin{bmatrix} 1 & T \\ 0 & 1 \end{bmatrix}$$

it means that F is a 4x4 matrix, with F_2 as blocks along the diagonal. Written out

$$F_{CV} = \begin{bmatrix} 1 & T & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & T \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

2. State Space

The process models all use cartesian coordinates. The state space is

$$\mathbf{x} = \begin{bmatrix} x \\ \dot{x} \\ y \\ \dot{y} \end{bmatrix}$$

3. Variables

The equation $x_k = Fx_{k-1} + Gu_{k-1} + Gw_k, \;\; w_k \sim \mathcal{N}(0, Q)$ should be read as

> *the **predicted state at time k** (x_k) is given by **evolving** (F) the **previous state** (x_{k-} G) the **controls** (u_{k-1}) given at the previous time step, and **adding normally distri*

The Paper

You can find the paper here: A comparative study of multiple-model algorithms fo tracking

Supporting Materials

A comparative study of multiple-model algorithms for maneuvering target tracking