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5. Properties Of Kalman Filtering Orthogonality Principle: (Ref. Panos J. Antsaklis And Anthony N. Michel, Linear Systems) If There Is A Positive Definite And Symmetric Matrix  $X$  And A Positive Definite And Symmetric Matrix  $Q$  Satisfying ,  $AXA^T - XQX^T = 0$ , (Lyapunov Equation) Then The Matrix  $A$  Is Stable. Conversely, If  $A$  Is Stable, Then, Given Any Symmetric Matrix  $X$ ,  $Q$ , The Above Feb 10th, 2024.

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Kalman Filtering In R - University Of California, Berkeley And Andrews(2001), West And Harrison(1997) Or Shumway And Sto Er(2006), To Name Only A Few.

We Reproduce Those Equations Here, However, As Repeated Reference Is Made To Them In The Sequel.

De Ne A T 1 = E[ T 1jy 0;::;y T 1](3) P T 1 = E[( T 1 A T 1)( T 1 A T 1) >] ;(4) Estimates Of The Mar 20th,

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K = + + - - - - - 1 1 1 1 1 (1) Y H X V k K K K = + (2) Where The Variable Definitions And Dimensions Are

Detailed In Table 1. Table 1. Dimensions Of Discrete Time System Variables Apr 12th, 2024.

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"steady-state" And Becomes A Linear Time- Invariant Filter (i.e.  $K[n]$  Constant,  $M[n|n]$  Constant) Kalman Filter Created Uncorrelated Sequence Of "innovations" Kalman Filter Is Optimal For Gaussian, If Not Gaussian, Optimal Linear MMSE  $M[n|n-1]$ ,  $M[n|n]$ ,  $K[n]$  Can Be Computed Off-line (ahead Of Time) Jan 23th, 2024.

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