Assumption: Ideal wrighted and bounded by known postine values:

IVIIF SVM, IIWIIFSWM, IIZIFSZM

(v o) = 2 mm

Assumption 2: dustrud trajectory is bounded by: NEQUT GUT GUT IT SON

Fact: Oct+) = (Int In Wind quit and) T

W bounded by: 11ml 50, Od + C2/1 MI a, c2 - vomputate newstants.

· Closed toop dynamic is using control algorithm

we get the following voion dynamic equation:

Mi=-LTKVLH-VIH+LT[WE(VIX)-WE(VIX)]

+ LT [Td+E+V] — ()

By empanding (VTa) in Taylor suries about 6 (VTa) and other manipulations:

 $\overline{M}\dot{H} = -L^{T}K_{V}L_{9} - V_{1}H + L^{T}\left[\widetilde{W}^{T}(\hat{G} - \hat{G}'\hat{V}^{T}\Lambda) + \widehat{W}^{T}\hat{G}'\tilde{V}^{T}\Lambda\right] + L^{T}\left(W+V\right)$

whom disturbance:

w(t) = WTô'VTa+WTD(VTa)2+Td+E

Museum: Lit NN Wight turing be provided and KDD, thun filtend tracking weren H(t), form mound and NN wight withmates an glébally uniformly boundel. Delepa-Eurale $\hat{W} = F 6 (\hat{V}^{T} \alpha) (Ln)^{T} - F \hat{\delta}' \hat{V}^{T} \alpha (Ln)^{T}$ $\hat{V} = C_{N}(\hat{s}'^T\hat{w}(Ln))^T - Kallen)||\hat{v}|$ - KFILMIN

Proof: Consider the Lyapunor Candidale: L= Intmatlifu(wTF'w) + Ita(VTCTV) TO AL = AL ri+ DL W + DL V D L= MTMH+ tul WF-W)+tn(VCTV)

On using the wight tunors scholgeto and also assuming $\dot{V} = \dot{w} = 0$, we get $\dot{L} = -(L_{H})^{T} K_{v} (L_{H}) + (L_{H})^{T} (w_{v})$ $+ K ||L_{H}|| \left[f_{n} \left(\tilde{w}^{T} (w_{v} - \tilde{w}) \right) + f_{n} \left(\tilde{v}^{T} (v_{v} - \tilde{v}) \right) \right]$

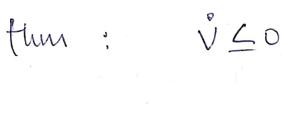
Using inquality: $th(2T(2-2)) = (2,2)_F - ||2||_F^2$ $\leq ||2||_F ||2||_F - ||2||_F^2$

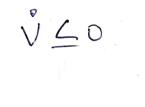
 $\pm V \leq [-Ln)^T K_V [Ln) + [Ln)^T (w+v) + K ||Ln|| [||Z||_F Z_m - ||Z||_F]$

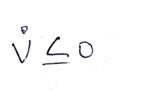
Alexander Hobitable • The disturbance turn is bounded according to: 11 WIT) 11 5 CO + C/11 2/18+ C2/12/18/19/1 C? -> Known constants · Using the about fact, wi get:

• Let
$$S_1 := \left(\frac{\kappa \left(\frac{2n+c_1 k}{4}\right)^2}{4}\right)$$

$$S_1 := \begin{cases} 1 \\ 1 \end{cases}$$

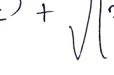




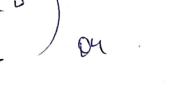


 $S_2 := \frac{(2m + CiVK)}{2} + \frac{(2m + CiV)^2 + (co)}{K}$









· $\zeta_1 := (Ln), \zeta_2 = \tilde{Z}$ thm 3 · Lt D: {] [] = 81,] = 623 Di: { 7 | 9, < 8, , 92 < 8, 3 where \$ 50 > 89 =D D C J2 · Whenever, Z:>Si > V(Z) won't invuerse 70 7 WILL Stry in JZ En D'us au invouvant 100 set. (Ln) and & will always stay fuside I after a finite possed of time.