Note Title 10/17/2012

Discrete-the Adapthre Control

Note that, for Adeptive Control, we consider the plant:

A(q') y(+) = q B(q') u(+)

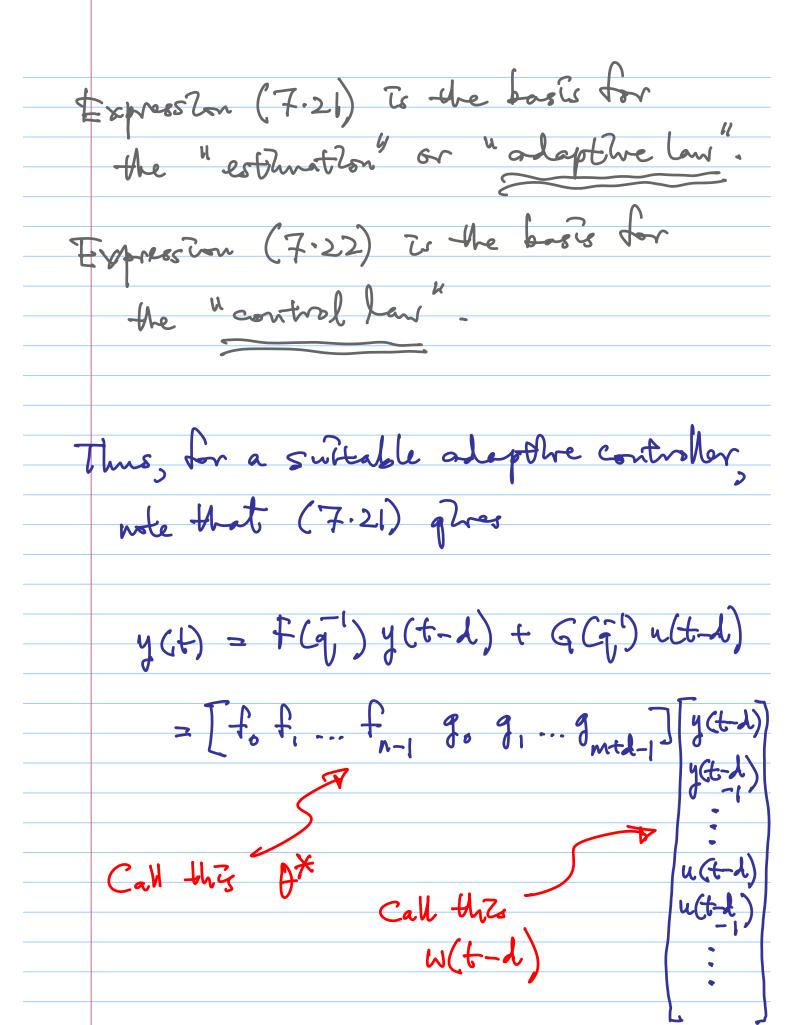
も20012330...

 $A(\bar{q}') = 1 + a_1 \bar{q}' + ... + a_n \bar{q}'$  $B(\bar{q}') = b_0 + b_1 \bar{q}' + ... + b_m \bar{q}'$ 

— (7.81)

Note that the control strategy that will be need is the 11 d-step ahead controller " (also allet "minum barrance controller", or "minimum pretietten error controller. Thus, see also the earler part where the reasons/Las2s for the control strategy were explained/d2s aussel. Ushy those Eleas, thus, consider the so-celled "prediction Ventily"? 1 = AGI) EGI) + gd FGI)

With E(1)=1+e19+...+ed-19, F(71) = fo + fig + ... + fung Check this !! -(7.02)Uszy (7.01) and (7.62) we  $A(\bar{q}')y(t) = \bar{q}^{d}B(\bar{q}')u(t)$  $E(\bar{q}') A(\bar{q}') y(H) = \bar{q}' E(\bar{q}') B(\bar{q}') u(H)$ -(7-11) Hrsz 1-9, 4fgi) = 90 + 919 + ... + 9 9,



or:
$$y(t) = 0 \times \omega(t-d) \qquad (7-25)$$

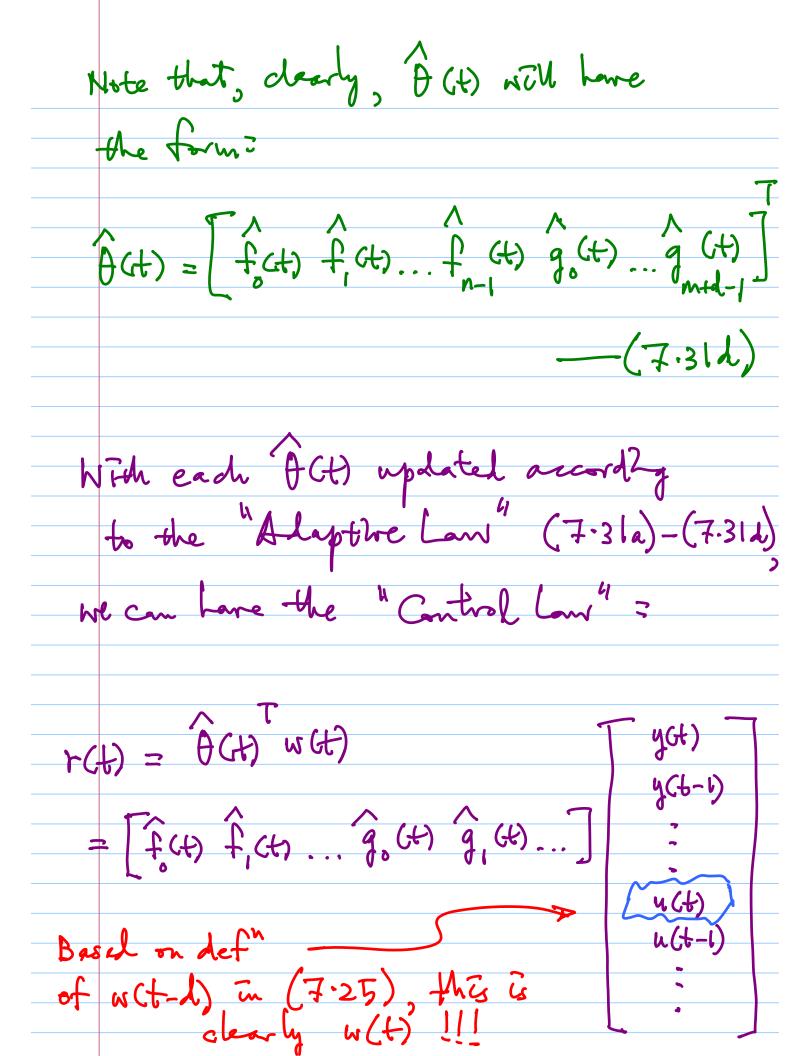
Basel on the consider the "Alaptire Law"?

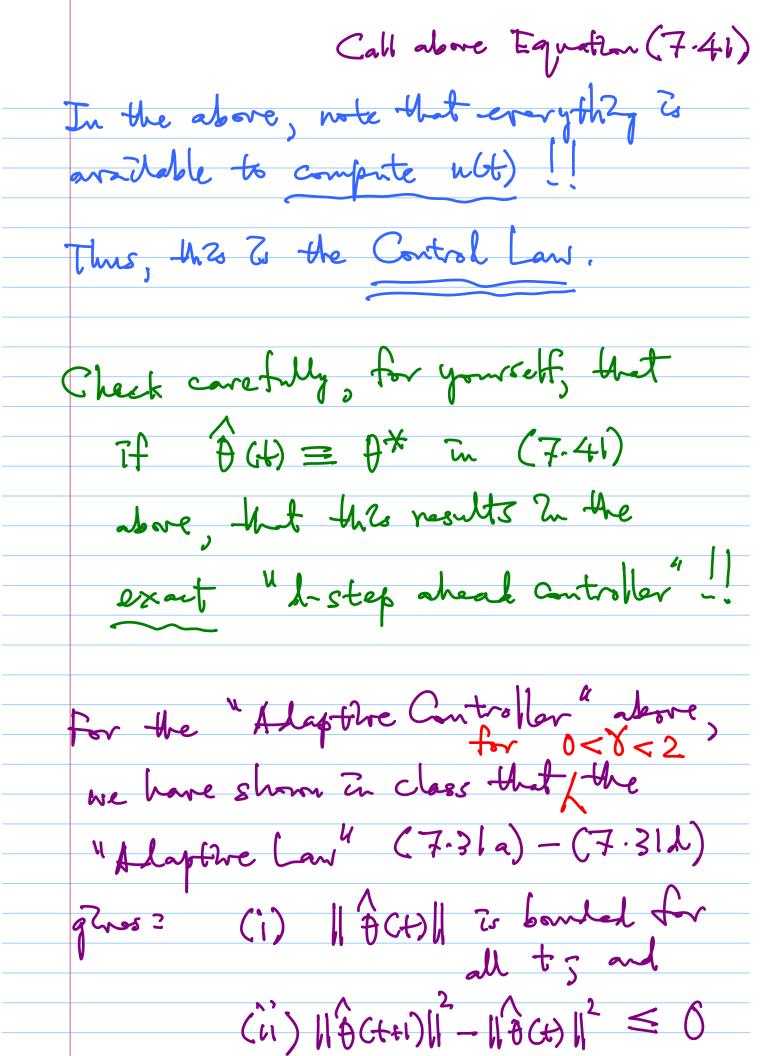
$$\hat{y}(t) = \hat{y}(t) w(t-\lambda) \qquad -(7.3|a)$$

$$e_{1}(t) = \hat{y}(t) - y(t) - (7.316)$$

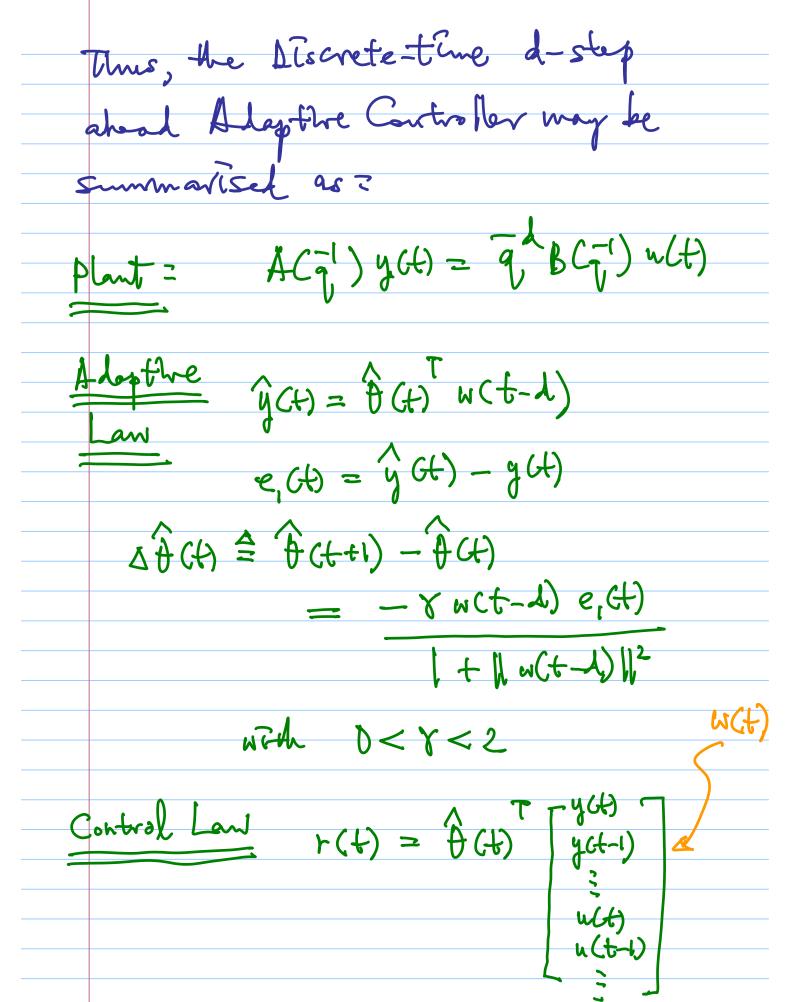
$$\Delta \hat{\varphi}(t) \stackrel{\triangle}{=} \hat{\varphi}(t+1) - \hat{\varphi}(t)$$

$$-(7.314)$$





and additional other properties .... Further, uszy the "key Technild Lemma, It is further possible to show ( we skipped this part; and thus not consilered for exams) that we ald 7+2 mally have = (1) { u(t)} and { y(t)} are bonded for all t 3 and (b) [2m {y(t+d) - r(t)} = 0 +>0 ---(7.52)



The Discrete-time d-step ahead Aleptire Controller des arthel above results 2 = (I) { || + (+) || }, { u(+) }, { y(+) } bombed for all t 3 and (I) Lhu {y(t+d) -r(t)} = 0

The above Summarises the key points

The class lecture. For your

enjoyment !!!