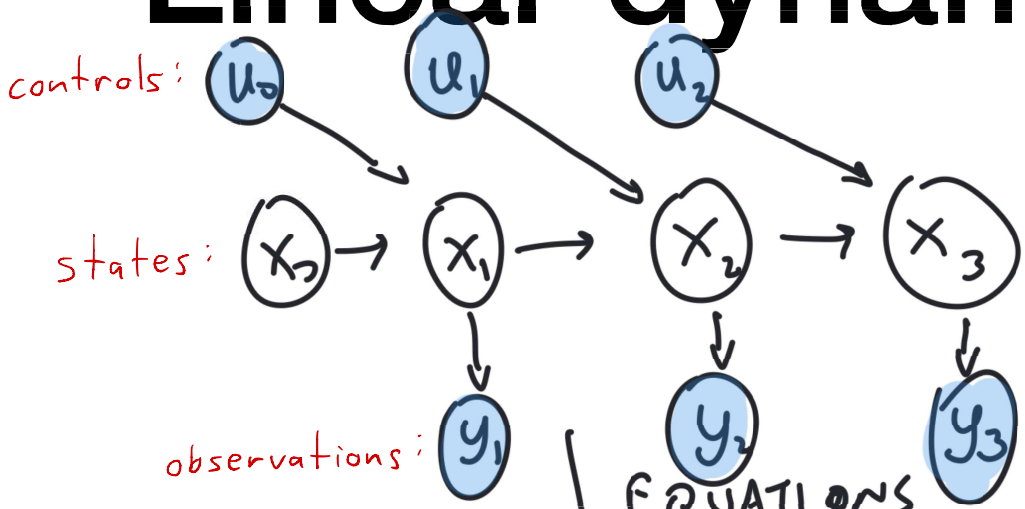
Linear dynamical systems



Dimensions:
$x \in \mathbb{R}^d$, $u \in \mathbb{R}^m$, $y \in \mathbb{R}^q$
$\mu_0 \in \mathbb{R}^d$, $z_0 \in \mathbb{R}^d$, $V_0 \in \mathbb{R}^{d \times d}$ p.d.
$A \in \mathbb{R}^{d \times d}$, $B \in \mathbb{R}^{d \times m}$; $Q \in \mathbb{R}^{d \times d}$ p.d.
$C \in \mathbb{R}^{q \times d}$, $w_n \in \mathbb{R}^q$, $R \in \mathbb{R}^{q \times q}$ p.d.

	EQUATIONS	PROBABILISTIC
Initial Prob.	$x_0 = \mu_0 + z_0$, $z_0 \sim N(0, V_0)$	$p(x_0) = N(x_0 \mid \mu_0, V_0)$
Transition Prob.	$x_{n+1} = A x_n + B u_n + z_n$, $z_n \sim N(0, Q)$	$p(x_{n+1} \mid x_n, u_n) = N(x_{n+1} \mid A x_n + B u_n, Q)$
Emission Prob.	$y_n = C x_n + w_n$, $w_n \sim N(0, R)$	$p(y_n \mid x_n) = N(y_n \mid C x_n, R)$