WiP Abstract: A Framework on Profiling Cross-Domain Noise Propagation in Control CPS

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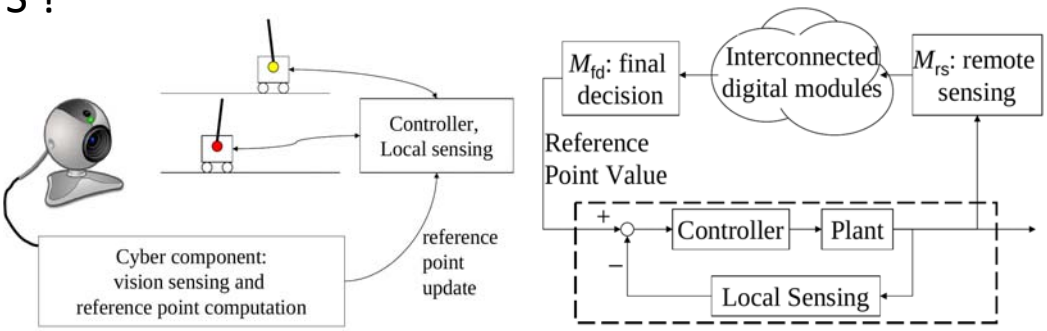
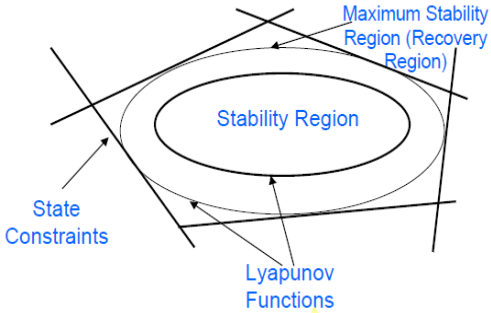
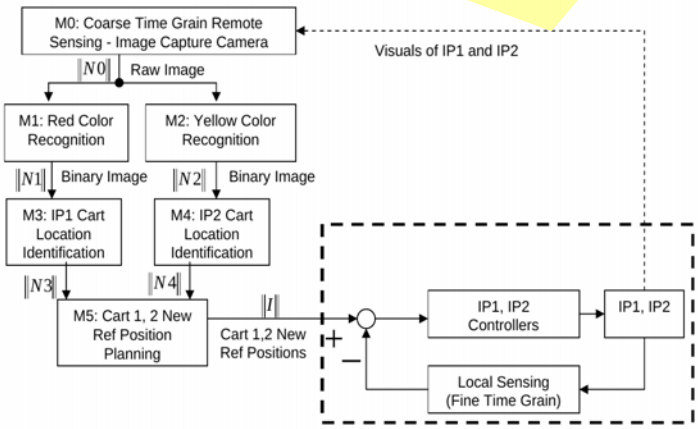
Question: How will noises from the cyber sub-system affect control CPS ?



Answer: A cross-domain noise profiling framework:

Monte Carlo of physical plant's initial state + noise, injected into the cyber subsystem.





Lyapunov invariant set theory accelerates reachability calculation

Hybrid-automata reachability measures impact of noises cross-domain

$$\frac{d(X(t)-O_{ref})}{dt} = \mathbf{F}(X(t)-O_{ref}), \quad \dot{t}=1$$

Reference Point Update Event : at time instance t_0, O_{ref} is assigned a new value $O'_{ref}(t_0)$.