LPE Reading Group
31 July 2001

Download paper on RoboFlag Drill from
http://www.tam.cornell.edu/~earl/LPE
D actions
input start \((p, v)\), \(p, v \in \mathbb{R}^3\)
output drive \((u)\), \(u \in \mathbb{R}^3\)
input position \((p)\), \(p \in \mathbb{R}^3\)
time \(v(t)\), \(t \in \mathbb{R}^+\)

Transitions:
- position \((p', t)\)
  - \(\text{Eff: } p_o := p'\)
  - \(p := p'\)
  - \(t := \text{new}\)
  - \(t := t\)
- \(V = \frac{(p - p_o)}{(\text{new} - t)}\)

state
\(p, p, v, t, p_o, v_o, t_o, u \in \mathbb{R}^3\)
\(t, v, \text{new} \in \mathbb{R}^+\)

drive \((u)\)
- \(\text{Pre: } u = u_i\)
- \(\text{Eff: } -\text{figure out } u\)
Position ($p$)

Eff: $p_{2} = p_{1}$

$P_{nw} = P$

$v = (p_{nw} - p_{0})/\Delta t$

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Start ($p_{f}, v_{f}$)

Eff: figure out $u$ est. $p_{f}, v_{f}$

Drive ($u$)

Pre: $u' = u$

Drive $\in [at, kat]$

Intersection $\in [at, kat]$

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Interception

Pre: $[p_{f} = P_{now} \land d]$

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Diagram:

$t_{i}, t_{i} + \Delta t$

$u(t), t \in [t_{i}, t_{i} + k \Delta t]$
Sensor position (p)
Eff: \( p_{\text{new}} = p \)

Sensor opponent (\( p^o, v^o \))
Eff: \( p^o = p^o \), \( v^o = v^o \)

drive (v)
Pre: control

Pre-interception
Pre: \( |p_q - p_{\text{now}}| < d \)
Eff: \( v = 0 \)

Thm: interception happens

drive (v)
Pre: figure out \( v \)
\( v = v \)

Sensor, Position
Output position (p)
Pre: p is correct

position \( e \in [0t, k\Delta t] \)