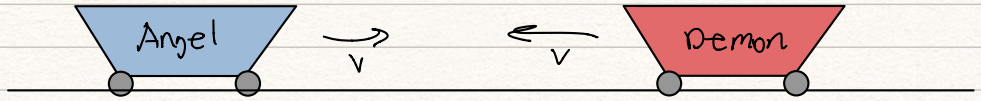
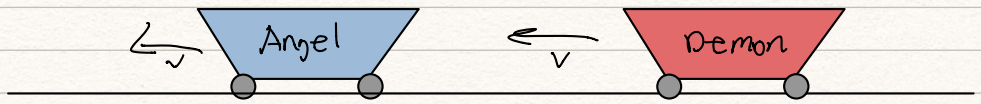
Tackling in 1D between Linemen

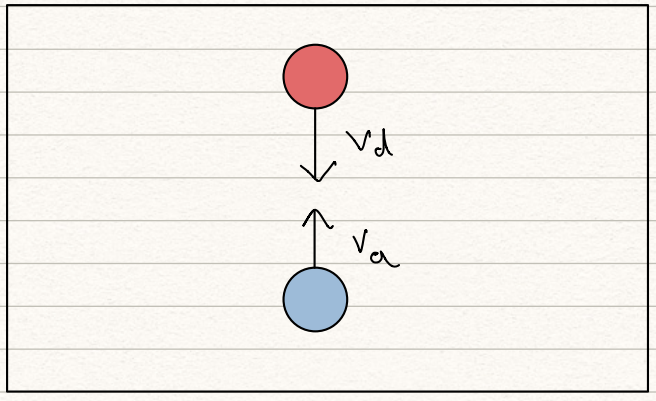


Tackling in 1D between Line / QB



Two-Hand Touch

Tackling in 2D btwn linemen

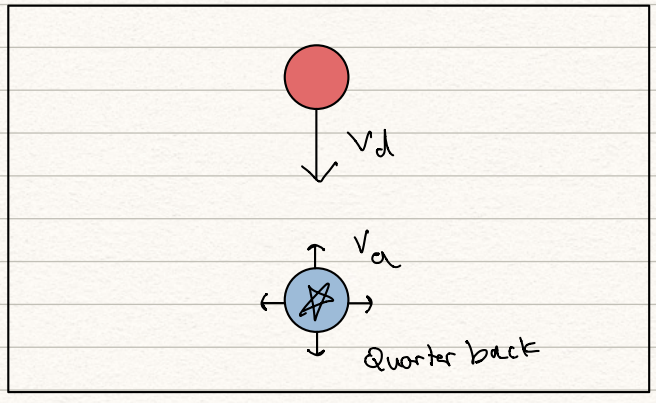


upon contact,

Slowly push back

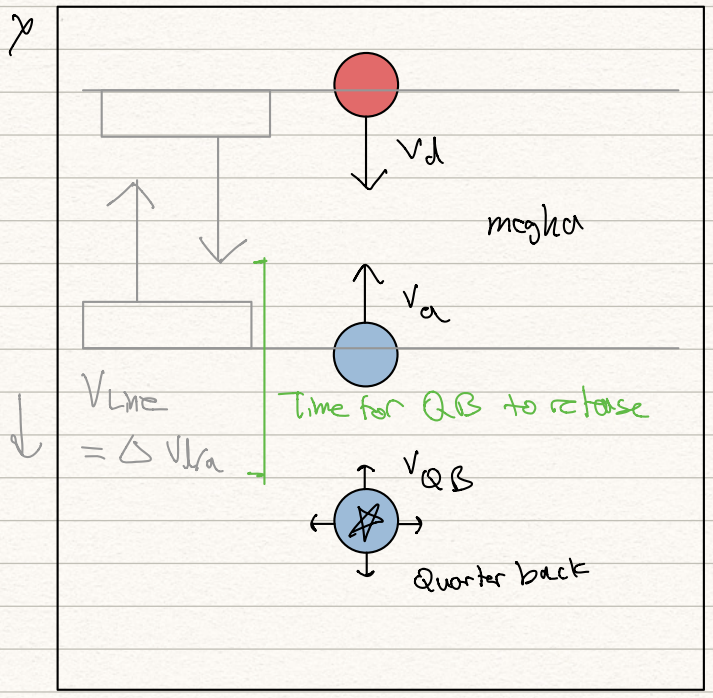
↳ next step:
struggle then ⇒ boom!

Tackling in 2D btwn QB



Intersection

Tackling in 2D btwn QB



where v is magnitude. $dy_d = -1$
$dy_a = 1$

- Two Hand Touch
  - ↳ infinitessmal points intersect
- ≤ 40 seconds
- DL be more powerful than OL
- QB moves in 4 directions

Problems:
- ↳ How to bound velocities
- ↳ How to consider dir

$0 < V_D - V_A < diff < diffMax$
(defense, offense)

$V_D <$ NFL Combine

```
{
  diff = *;
  V_D = *;
  V_A = V_D - diff
```

[QB controller]

Variables

V_D demon vel/pos/dir
Y_D
dV_D ← -1

V_A angel vel/pos/dir
Y_A
dY_A ← +1

V_{QB} QB vel/pos/dir
Y_{QB}
dY_{QB} ← ?

T = 40 sec (clock)
t = time

avg human walk speed = 4.6 ft/s

WR - 40yd: 4.48 = 26.8 ft/s
other defense - 40 yd: 4.55 = 26.4 ft/s
DL - 40yd: 5.06 = 23.7 ft/s
OL - 40yd: 5.32 = 22.5 ft/s

& Football field range

before lines collide

```
?(~)
{
  Y_A' = dy_A · V_A
  Y_D' = dy_D · V_D
  QB ~ [bad controller]
  t' = 1
  & Y_A < Y_D
  ∩ t ≤ 1
}
```

∪ (choose either ODE)

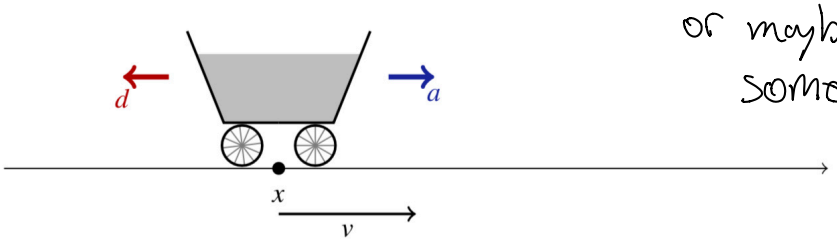
after collide

```
?(~)
{
  Y_A' = dy_D · V_D - dy_A · V_A
  Y_D' = dy_D · V_D - dy_A · V_A
  QB ~ [bad]
  t' = 1
```

& $Y_A \geq Y_D$
$\wedge\ t \leq 1$
}
; ?($t \leq 40$) ← pseudo domain constraint

Find state w/ a winning strategy

$\langle (?(Y_A < Y_D); \{ \text{before ODE} \} \mathbin{++} ?(Y_A \geq Y_D); \{ \text{after ode} \}); ?(t \leq 40) \rangle$

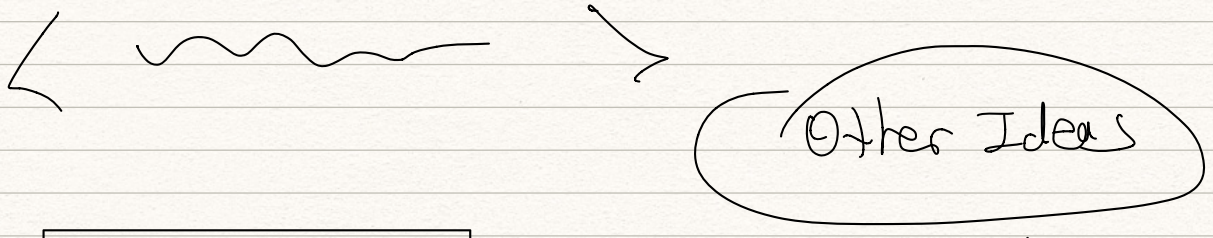


or maybe something like this

Fig. 14.2 Angel and Demon accelerating or braking by a and d, respectively, the cart at position x, which is moving with velocity x

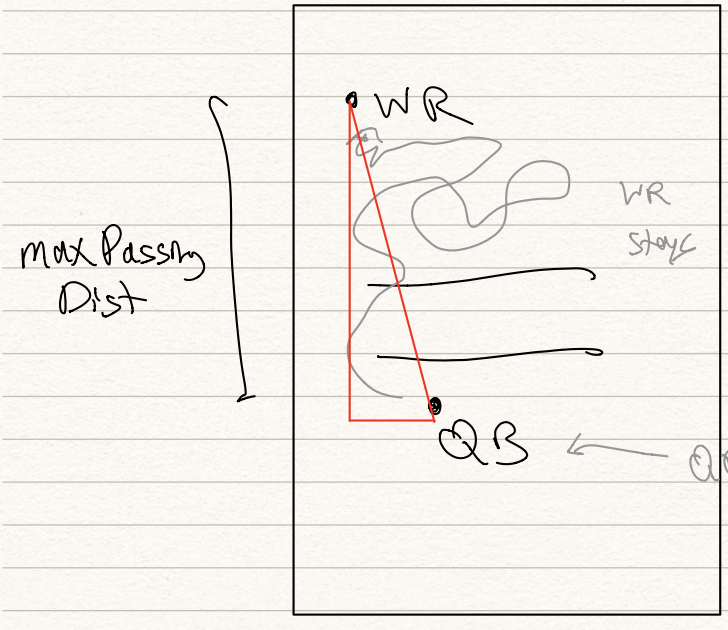
each exert either an accelerating force or a braking force on x (Fig. 14.2):

$$\left((a := 1 \cup a := -1); (d := 1 \cup d := -1)^{d}; \{x' = v, v' = a + d\}\right)^{*} \qquad (14.1)$$



Other Ideas

- cap = QB_y − Stadium
  = QB_x − stadium
  ~~not a strategy~~ max, physics restriction
- cap = min(ΔQB/stad, max Pass)
  ↳ one condition for pass is $|WR| - |QB| \leq$ bound



QB needs access to WR_x, WR_y