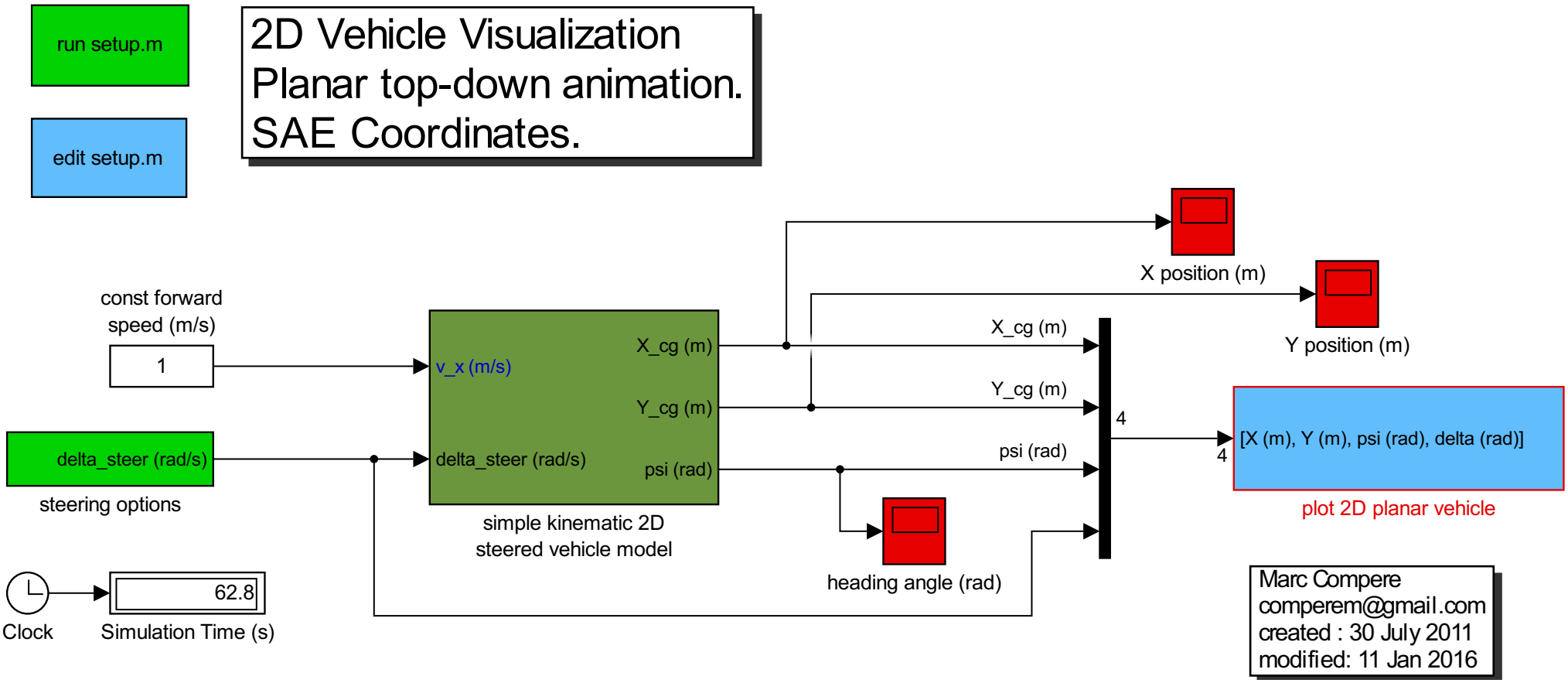
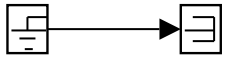
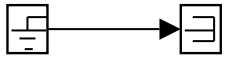
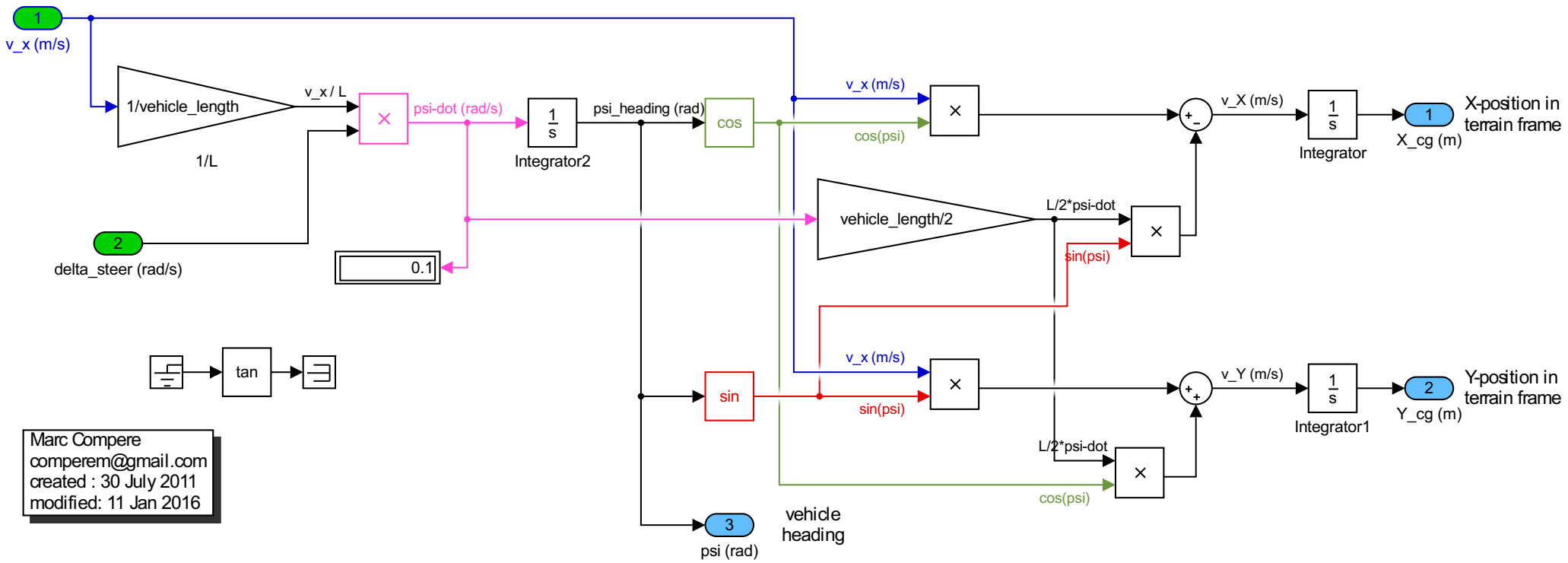

run setup.m
edit setup.m
2D Vehicle Visualization
Planar top-down animation.
SAE Coordinates.
const forward
speed (m/s)
1
delta_steer (rad/s)
steering options
Clock
62.8
Simulation Time (s)
v_x (m/s)
delta_steer (rad/s)
X_cg (m)
Y_cg (m)
psi (rad)
simple kinematic 2D
steered vehicle model
X position (m)
Y position (m)
heading angle (rad)
X_cg (m)
Y_cg (m)
psi (rad)
4
4
[X (m), Y (m), psi (rad), delta (rad)]
plot 2D planar vehicle
Marc Compere
comperem@gmail.com
created : 30 July 2011
modified: 11 Jan 2016





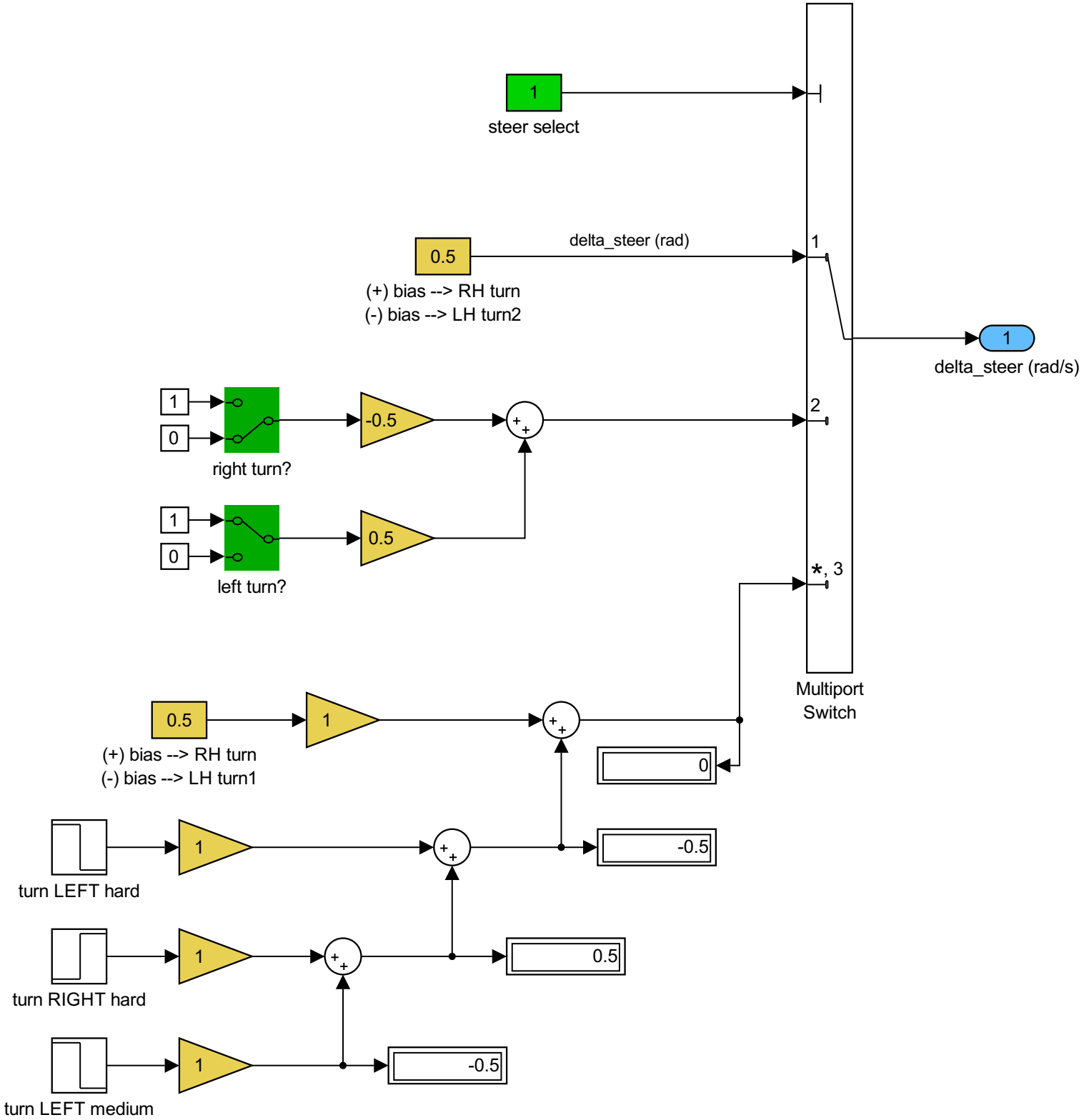


Simple kinematic vehicle model of wheelbase length L and width W.
Non-holonomic constraints on front and rear wheels allow rolling at low speed with no slipping:

$$v_X = [\, v_x \cdot \cos(\psi_{heading}) - (L/2) \cdot \omega_z \cdot \sin(\psi_{heading}) \,]$$
$$v_Y = [\, v_x \cdot \sin(\psi_{heading}) + (L/2) \cdot \omega_z \cdot \cos(\psi_{heading}) \,]$$

where:

- v_x - body-fixed vehicle velocity
- v_X - terrain frame X velocity
- v_Y - terrain frame Y velocity
- ψ-dot - same as ω_z
- ψ-dot - $(v_x/L) \cdot \delta_{steer}$


1
steer select
0.5
(+) bias --> RH turn
(-) bias --> LH turn2
delta_steer (rad)
1
1
delta_steer (rad/s)
2
1
0
-0.5
right turn?
1
0
0.5
left turn?
*, 3
Multiport
Switch
0.5
(+) bias --> RH turn
(-) bias --> LH turn1
1
0
turn LEFT hard
1
-0.5
turn RIGHT hard
1
0.5
turn LEFT medium
1
-0.5