```
clear all; clc; close all;

addpath('./utils')
```

Physics parameter

```
parameter.physics.gravitational_constant=9.81; % Gravity

% parameter.physics.sim2real_scale_factor=(13.3-11.6620+5.75)/5.75; %
 Real spirit
parameter.physics.sim2real_scale_factor=1; % Sim spirit or A1

%
 parameter.physics.mass_body_body=parameter.physics.sim2real_scale_factor*5.75;
 % Only body weight of spirit
%
 parameter.physics.mass_body_body=parameter.physics.sim2real_scale_factor*6.0;
 % Only body weight of A1
parameter.physics.mass_body_body=parameter.physics.sim2real_scale_factor*5.204; %
 Only body weight of Go1

% parameter.physics.mass_body_leg=1.478; % Each leg weight of spirit
% parameter.physics.mass_body_leg=1.935; % Each leg weight of A1
parameter.physics.mass_body_leg = 1.702; % Each leg weight of Go1

parameter.physics.mass_body=parameter.physics.mass_body_body+...
    4*parameter.physics.mass_body_leg; % Total body weight

% parameter.physics.hip_offset=[0.2263; 0.098; 0]; % Absolute hip
 offset from body COM of spirit
% parameter.physics.hip_offset=[0.1805; 0.047; 0]; % Absolute hip
 offset from body COM of A1
parameter.physics.hip_offset=[0.1881; 0.04675; 0]; % Absolute hip
 offset from body COM of Go1

%
 parameter.physics.inertia_body=parameter.physics.sim2real_scale_factor*...
%     diag([0.05; 0.1; 0.1]); % Body inertia of spirit
%
 parameter.physics.inertia_body=parameter.physics.sim2real_scale_factor*...
%     [0.0158533, -3.66e-5, -6.11e-5;
%     -3.66e-5, 0.0377999, -2.75e-5;
%     -6.11e-5, -2.75e-5, 0.0456542]; % Body inertia of A1
parameter.physics.inertia_body=parameter.physics.sim2real_scale_factor*...
    [0.0168352186, 0.0004636141, 0.0002367952;
    0.0004636141, 0.0656071082, 0.000036671;
    0.0002367952, 0.000036671, 0.0742720659]; % Body inertia of A1

parameter.physics.inertia_body=parameter.physics.inertia_body+...
    4*parameter.physics.mass_body_leg*...

 diag([parameter.physics.hip_offset(2)^2+parameter.physics.hip_offset(3)^2;
```

```
 parameter.physics.hip_offset(1)^2+parameter.physics.hip_offset(3)^2;

 parameter.physics.hip_offset(1)^2+parameter.physics.hip_offset(2)^2]); %
 Robot inertia (assume leg mass concentrated at hip)

parameter.name = "go1"; % Model name
parameter.n = 12; % State dimension
parameter.m = 12; % Input dimension
```

Generate Dynamics Model

```
dynamicsModel(parameter);
```

```
Warning: Directory already exists.
Warning: Directory already exists.
Warning: Directory already exists.
simplifying L 1/1
simplifying tmp 1/6
simplifying tmp 2/6
simplifying tmp 3/6
simplifying tmp 4/6
simplifying tmp 5/6
simplifying tmp 6/6
simplifying tmp2 1/36
simplifying tmp2 2/36
simplifying tmp2 3/36
simplifying tmp2 4/36
simplifying tmp2 5/36
simplifying tmp2 6/36
simplifying tmp2 7/36
simplifying tmp2 8/36
simplifying tmp2 9/36
simplifying tmp2 10/36
simplifying tmp2 11/36
simplifying tmp2 12/36
simplifying tmp2 13/36
simplifying tmp2 14/36
simplifying tmp2 15/36
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simplifying tmp2 29/36
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simplifying tmp2 30/36
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simplifying h 3/6
simplifying h 4/6
simplifying h 5/6
simplifying h 6/6
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simplifying J_feet 2/72
simplifying J_feet 3/72
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simplifying J_feet 5/72
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simplifying J_feet 70/72
simplifying J_feet 71/72
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simplifying q_dot 1/6
simplifying q_dot 2/6
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simplifying q_dot 4/6
simplifying q_dot 5/6
simplifying q_dot 6/6
```

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