```matlab
function [w_sim_ar, t_sim_ar, tr_sim, wterm_sim] = motor_sim_ODE45(config,
 param_var, param_fixed)
% ODE45 method simulation of motor

pl_flag = true; % true (1) or false (0) to use to turn plotting on or off

% Motor Parameters
w_nl = param_fixed.wn*config.pwm/100; % No load speed in [rad/s] at PWM
 percentatge
tau_s =  param_fixed.trq_stall*config.pwm/100; % Stall torque in [N-m] at PWM
 percentage
I_r = param_var.j_eff;  % effective rotational inertia reflected to motor in
 [kg*m^2]
rho_air = 1.204; % Density of air at 20C [kg/m^3]
A_cross = .005*.01; % Cross sectional area of bolt/nuts [m^2]
r_bolt = .0508; % Bolt distance from center of flywheel [m]

% Calculate number of bolts
nbolt = 0;
for i = 1:length(config.nut_ar)
    if config.nut_ar(i) == 0
    else
        nbolt = nbolt + 1;
    end
end

% Simulation Parameters are hard coded for convinence
tspan = [0 10]; % Time for simulation

% Calculate Constant part of Drag for number of bolts
Tau_d = 1/2*rho_air*A_cross*r_bolt^3/param_fixed.ngear^2;

% Initial conditions
w0 = 0; % Initial angular velocity [rad/s]


% ODE45 Sim

[t,w] = ode45(@(t,w) 1/I_r*((tau_s-w*tau_s/w_nl)- param_var.Tau_f -
 nbolt*(param_var.cd*Tau_d*w^2)), tspan, w0);

tr_sim = 0;
wterm_sim = 0;

% load varaibles into output variables
w_sim_ar = w;
t_sim_ar = t;

% convert to RPM - not the most efficient code, but easy to read
omega_deg_psec = w*180/pi;
omega_rpm = omega_deg_psec*60/360;
```

```matlab
omega_terminal_rpm = omega_rpm(end);  % since we assume the duration is enough
 to reach terminal velocity, the last point in array is used to define the
 terminal velocity

% Finding terminal velocity from filtered data
wterm_sim = mean(omega_rpm(length(omega_rpm)-20:end)); % [RPM]

% Finding rise time
threshold = 0.63 * wterm_sim; % rise time = 63% of terminal velocity
tr_index = find(omega_rpm <= threshold,1,'last'); % index of time value where
 velocity = 63%
tr_sim = t(tr_index); % rise time value at that index

if pl_flag == true

        figure(1);
        plot(t,omega_rpm, 'LineWidth',2, 'color', [0 0.4470 0.7410]);
        xline(tr_sim,'r');
        yline(wterm_sim,'r');
        hold on

end % end of plot code

Not enough input arguments.

Error in motor_sim_ODE45 (line 7)
w_nl = param_fixed.wn*config.pwm/100; % No load speed in [rad/s] at PWM
 percentatge
```

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