```matlab
clear all
clc

original_domain = 0:.01:pi;
exponent_vector = [0 1 2 3 4];
transpose_vector = [0 0 0 0 0];

original_range = -1*original_domain.^2;

%displays original curve--------------------------------------------
figure, plot(original_domain,original_range)

%possible coeficients----------------------------------------------
problem_domain(1,:) = -5:0.1:5;
problem_domain(2,:) = -5:0.1:5;
problem_domain(3,:) = -5:0.1:5;
problem_domain(4,:) = -5:0.1:5;
problem_domain(5,:) = -5:0.1:5;

%intercepts--------------------------------------------------------
problem_domain(6,:) = -5:0.1:5;
problem_domain(7,:) = -5:0.1:5;
problem_domain(8,:) = -5:0.1:5;
problem_domain(9,:) = -5:0.1:5;
problem_domain(10,:) = -5:0.1:5;

%search paramenters-------------------------------------------------
num_iterations = 500;
search_depth = 50;
tic;
final_problem_domain = Mem_Interf_Rand_Optimization(problem_domain,
original_domain, original_range, num_iterations, search_depth, exponent_vector,
transpose_vector);
toc

%plots results------------------------------------------------------
interp_range = eval_polynomial(problem_domain, final_problem_domain,
original_domain, exponent_vector, transpose_vector);


figure, plot(original_domain,interp_range)
```