

# CSE6338: Assignment 1

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## 1 ICP

Using your implementation of Horn's method from Assignment 1, implement ICP (you do not need to implement efficient nearest neighbour search). Your implementation should take as input the model point set, a data point set, an initial estimate of the registration transformation, and the threshold tolerance for stopping the iteration.

*Test data will be posted shortly.* Write a simulation that studies the sensitivity of ICP to the accuracy of the initial estimate of the registration transformation. For example, to test the sensitivity to rotation about the z-axis you would do something like:

```
for angle = -10:10
  for trial = 1:NUM_TRIAL
    % get a new data point set; see test data code
    % rotate the data point set by angle degrees around z-axis
    % use ICP to register data to model
    % compute the error in the estimated rotation angle
    % compute the error in the estimated translation distance
  end
  % compute average rotation angle error for this angle
  % compute average translation distance error for this angle
end
% plot average rotation angle error as a function of angle
% plot average translation distance error as a function of angle
```

Your simulation should test the sensitivity to rotations about  $x$ ,  $y$ , and  $z$ , and translations along  $x$ ,  $y$ , and  $z$ .

Submit all of your Matlab files in a ZIP archive by email.