```
load('TrainingSamplesDCT_subsets_8.mat')
cheetah_img=imread('cheetah.bmp');
mask=imread('cheetah_mask.bmp');
[m,n]=size(cheetah_img);

%Strategy 1
load('Prior_1.mat');
load('Alpha.mat');
alpha=load('Alpha.mat').alpha;

%Dataset 1
[numSamplesBG, ~] = size(D1_BG);
[numSamplesFG, ~] = size(D1_FG);
probabilityBG = numSamplesBG / (numSamplesBG + numSamplesFG);
probabilityFG = numSamplesFG / (numSamplesBG + numSamplesFG);
backgroundMean = mean(D1_BG(:, 1:64), 1);
backgroundCovariance = (D1_BG(:, 1:64) - backgroundMean)' * (D1_BG(:, 1:64)
- backgroundMean) / numSamplesBG;
foregroundMean = mean(D1_FG(:, 1:64), 1);
foregroundCovariance = (D1_FG(:, 1:64) - foregroundMean)' * (D1_FG(:, 1:64)
- foregroundMean) / numSamplesFG;
priorCovariance = diag(W0);
index = 1;
zigzagPatternData = load('Zig-Zag Pattern.txt');
zigzagPattern = zigzagPatternData(:)' + 1;

for row = 1:m-7
    for col = 1:n-7
        featureMatrix(:, index) = reshape(dct2(double(cheetah_img(row:row+7,
col:col+7)) / 255.0)', [64, 1]);
        featureMatrix(zigzagPattern, index) = featureMatrix(:, index);
        index = index + 1;
    end
end

sumFG = sum(mask(:) == 255);
sumBG = numel(mask) - sumFG;
MAP = [];
ML = [];
PD = [];

for i = 1:9
    currentAlpha = alpha(i);
    adjustedPriorCovariance = currentAlpha * priorCovariance;
    updatedForegroundMean = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG)
* foregroundMean' + foregroundCovariance / numSamplesFG *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) * mu0_FG';
    updatedBackgroundMean = adjustedPriorCovariance *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG)
* backgroundMean' + backgroundCovariance / numSamplesBG *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) * mu0_BG';
```

```
    updatedForegroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) *
foregroundCovariance / numSamplesFG;
    updatedBackgroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) *
backgroundCovariance / numSamplesBG;
    finalForegroundCovariance = updatedForegroundCovariance +
foregroundCovariance;
    finalBackgroundCovariance = updatedBackgroundCovariance +
backgroundCovariance;
    index = 1;
    PD_FG = 0;
    PD_BG = 0;
    ML_FG = 0;
    ML_BG = 0;
    MAP_FG = 0;
    MAP_BG = 0;

    for j = 1:m-7
        for h = 1:n-7
            X = featureMatrix(1:64, index);

            % Predictive
            i1_PD = -0.5 * (X - updatedBackgroundMean)' *
inv(finalBackgroundCovariance) * (X - updatedBackgroundMean) ...
                    - 0.5 * log((2 * pi)^64 *
det(finalBackgroundCovariance)) + log(probabilityBG);
            i2_PD = -0.5 * (X - updatedForegroundMean)' *
inv(finalForegroundCovariance) * (X - updatedForegroundMean) ...
                    - 0.5 * log((2 * pi)^64 *
det(finalForegroundCovariance)) + log(probabilityFG);

            if i1_PD > i2_PD
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                PD_BG = PD_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                PD_FG = PD_FG + 1;
            end


            % MAP
            i1_MAP = -0.5 * (X - updatedBackgroundMean)' *
inv(backgroundCovariance) * (X - updatedBackgroundMean) ...
                     - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
log(probabilityBG);

            i2_MAP = -0.5 * (X - updatedForegroundMean)' *
```

```
inv(foregroundCovariance) * (X - updatedForegroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);


            if i1_MAP > i2_MAP
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                MAP_BG = MAP_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                MAP_FG = MAP_FG + 1;
            end

            index = index + 1;


            % ML
            i1_ML = -0.5 * (X - backgroundMean')' *
inv(backgroundCovariance) * (X - backgroundMean') ...
                    - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
log(probabilityBG);
            i2_ML = -0.5 * (X - foregroundMean')' *
inv(foregroundCovariance) * (X - foregroundMean') ...
                    - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);

            if i1_ML > i2_ML
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                ML_BG = ML_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                ML_FG = ML_FG + 1;
            end

        end
    end

    PD(i) = PD_BG / sumBG * probabilityBG + PD_FG / sumFG * probabilityFG;
    ML(i) = ML_BG / sumBG * probabilityBG + ML_FG / sumFG * probabilityFG;
    MAP(i) = MAP_BG / sumBG * probabilityBG + MAP_FG / sumFG * probabilityFG;
end
```

```
figure;
plot(alpha, ML, '-o', 'DisplayName', 'ML');
hold on;
plot(alpha, MAP, '-s', 'DisplayName', 'MAP');
plot(alpha, PD, '-d', 'DisplayName', 'PD');
set(gca, 'XScale', 'log');
xlabel('log(\alpha)');
ylabel('Probability of Error');
title('Dataset 1 Strategy 1');
legend('Location', 'best', 'FontSize', 10);
set(gca);



%  %Dataset 2
[numSamplesBG, ~] = size(D2_BG);
[numSamplesFG, ~] = size(D2_FG);
probabilityBG = numSamplesBG / (numSamplesBG + numSamplesFG);
probabilityFG = numSamplesFG / (numSamplesBG + numSamplesFG);
backgroundMean = mean(D2_BG(:, 1:64), 1);
backgroundCovariance = (D2_BG(:, 1:64) - backgroundMean)' * (D2_BG(:, 1:64)
- backgroundMean) / numSamplesBG;
foregroundMean = mean(D2_FG(:, 1:64), 1);
foregroundCovariance = (D2_FG(:, 1:64) - foregroundMean)' * (D2_FG(:, 1:64)
- foregroundMean) / numSamplesFG;
priorCovariance = diag(W0);
index = 1;
zigzagPatternData = load('Zig-Zag Pattern.txt');
zigzagPattern = zigzagPatternData(:)' + 1;

for row = 1:m-7
    for col = 1:n-7
        featureMatrix(:, index) = reshape(dct2(double(cheetah_img(row:row+7,
col:col+7)) / 255.0)', [64, 1]);
        featureMatrix(zigzagPattern, index) = featureMatrix(:, index);
        index = index + 1;
    end
end

sumFG = sum(mask(:) == 255);
sumBG = numel(mask) - sumFG;
MAP = [];
ML = [];
PD = [];

for i = 1:9
    currentAlpha = alpha(i);
    adjustedPriorCovariance = currentAlpha * priorCovariance;
    updatedForegroundMean = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG)
* foregroundMean' + foregroundCovariance / numSamplesFG *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) * mu0_FG';
    updatedBackgroundMean = adjustedPriorCovariance *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG)
```

```
* backgroundMean' + backgroundCovariance / numSamplesBG *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) * mu0_BG';
    updatedForegroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) *
foregroundCovariance / numSamplesFG;
    updatedBackgroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) *
backgroundCovariance / numSamplesBG;
    finalForegroundCovariance = updatedForegroundCovariance +
foregroundCovariance;
    finalBackgroundCovariance = updatedBackgroundCovariance +
backgroundCovariance;
    index = 1;
    PD_FG = 0;
    PD_BG = 0;
    ML_FG = 0;
    ML_BG = 0;
    MAP_FG = 0;
    MAP_BG = 0;

    for j = 1:m-7
        for h = 1:n-7
            X = featureMatrix(1:64, index);

            % Predictive
            i1_PD = -0.5 * (X - updatedBackgroundMean)' *
inv(finalBackgroundCovariance) * (X - updatedBackgroundMean) ...
                    - 0.5 * log((2 * pi)^64 *
det(finalBackgroundCovariance)) + log(probabilityBG);
            i2_PD = -0.5 * (X - updatedForegroundMean)' *
inv(finalForegroundCovariance) * (X - updatedForegroundMean) ...
                    - 0.5 * log((2 * pi)^64 *
det(finalForegroundCovariance)) + log(probabilityFG);

            if i1_PD > i2_PD
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                PD_BG = PD_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                PD_FG = PD_FG + 1;
            end


            % MAP
            i1_MAP = -0.5 * (X - updatedBackgroundMean)' *
inv(backgroundCovariance) * (X - updatedBackgroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
log(probabilityBG);
```

```
            i2_MAP = -0.5 * (X - updatedForegroundMean)' *
inv(foregroundCovariance) * (X - updatedForegroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);


            if i1_MAP > i2_MAP
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                MAP_BG = MAP_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                MAP_FG = MAP_FG + 1;
            end

            index = index + 1;


            % ML
            i1_ML = -0.5 * (X - backgroundMean')' *
inv(backgroundCovariance) * (X - backgroundMean') ...
                    - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
log(probabilityBG);
            i2_ML = -0.5 * (X - foregroundMean')' *
inv(foregroundCovariance) * (X - foregroundMean') ...
                    - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);

            if i1_ML > i2_ML
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                ML_BG = ML_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                ML_FG = ML_FG + 1;
            end

        end
    end

    PD(i) = PD_BG / sumBG * probabilityBG + PD_FG / sumFG * probabilityFG;
    ML(i) = ML_BG / sumBG * probabilityBG + ML_FG / sumFG * probabilityFG;
    MAP(i) = MAP_BG / sumBG * probabilityBG + MAP_FG / sumFG * probabilityFG;
```

```
end

figure;
plot(alpha, ML, '-o', 'DisplayName', 'ML');
hold on;
plot(alpha, MAP, '-s', 'DisplayName', 'MAP');
plot(alpha, PD, '-d', 'DisplayName', 'PD');
set(gca, 'XScale', 'log');
xlabel('log(\alpha)');
ylabel('Probability of Error');
title('Dataset 2 Strategy 1');
legend('Location', 'best', 'FontSize', 10);
set(gca);


%Dataset 3
[numSamplesBG, ~] = size(D3_BG);
[numSamplesFG, ~] = size(D3_FG);
probabilityBG = numSamplesBG / (numSamplesBG + numSamplesFG);
probabilityFG = numSamplesFG / (numSamplesBG + numSamplesFG);
backgroundMean = mean(D3_BG(:, 1:64), 1);
backgroundCovariance = (D3_BG(:, 1:64) - backgroundMean)' * (D3_BG(:, 1:64)
- backgroundMean) / numSamplesBG;
foregroundMean = mean(D3_FG(:, 1:64), 1);
foregroundCovariance = (D3_FG(:, 1:64) - foregroundMean)' * (D3_FG(:, 1:64)
- foregroundMean) / numSamplesFG;
priorCovariance = diag(W0);
index = 1;
zigzagPatternData = load('Zig-Zag Pattern.txt');
zigzagPattern = zigzagPatternData(:)' + 1;

for row = 1:m-7
    for col = 1:n-7
        featureMatrix(:, index) = reshape(dct2(double(cheetah_img(row:row+7,
col:col+7)) / 255.0)', [64, 1]);
        featureMatrix(zigzagPattern, index) = featureMatrix(:, index);
        index = index + 1;
    end
end

sumFG = sum(mask(:) == 255);
sumBG = numel(mask) - sumFG;
MAP = [];
ML = [];
PD = [];

for i = 1:9
    currentAlpha = alpha(i);
    adjustedPriorCovariance = currentAlpha * priorCovariance;
    updatedForegroundMean = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG)
* foregroundMean' + foregroundCovariance / numSamplesFG *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) * mu0_FG';
    updatedBackgroundMean = adjustedPriorCovariance *
```

```
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG)
* backgroundMean' + backgroundCovariance / numSamplesBG *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) * mu0_BG';
    updatedForegroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) *
foregroundCovariance / numSamplesFG;
    updatedBackgroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) *
backgroundCovariance / numSamplesBG;
    finalForegroundCovariance = updatedForegroundCovariance +
foregroundCovariance;
    finalBackgroundCovariance = updatedBackgroundCovariance +
backgroundCovariance;
    index = 1;
    PD_FG = 0;
    PD_BG = 0;
    ML_FG = 0;
    ML_BG = 0;
    MAP_FG = 0;
    MAP_BG = 0;

    for j = 1:m-7
        for h = 1:n-7
            X = featureMatrix(1:64, index);

            % Predictive
            i1_PD = -0.5 * (X - updatedBackgroundMean)' *
inv(finalBackgroundCovariance) * (X - updatedBackgroundMean) ...
                    - 0.5 * log((2 * pi)^64 *
det(finalBackgroundCovariance)) + log(probabilityBG);
            i2_PD = -0.5 * (X - updatedForegroundMean)' *
inv(finalForegroundCovariance) * (X - updatedForegroundMean) ...
                    - 0.5 * log((2 * pi)^64 *
det(finalForegroundCovariance)) + log(probabilityFG);

            if i1_PD > i2_PD
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                PD_BG = PD_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                PD_FG = PD_FG + 1;
            end


            % MAP
            i1_MAP = -0.5 * (X - updatedBackgroundMean)' *
inv(backgroundCovariance) * (X - updatedBackgroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
```

```
log(probabilityBG);

            i2_MAP = -0.5 * (X - updatedForegroundMean)' *
inv(foregroundCovariance) * (X - updatedForegroundMean) ...
                      - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);


            if i1_MAP > i2_MAP
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                MAP_BG = MAP_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                MAP_FG = MAP_FG + 1;
            end

            index = index + 1;


            % ML
            i1_ML = -0.5 * (X - backgroundMean')' *
inv(backgroundCovariance) * (X - backgroundMean') ...
                    - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
log(probabilityBG);
            i2_ML = -0.5 * (X - foregroundMean')' *
inv(foregroundCovariance) * (X - foregroundMean') ...
                    - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);

            if i1_ML > i2_ML
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                ML_BG = ML_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                ML_FG = ML_FG + 1;
            end

        end
    end

    PD(i) = PD_BG / sumBG * probabilityBG + PD_FG / sumFG * probabilityFG;
    ML(i) = ML_BG / sumBG * probabilityBG + ML_FG / sumFG * probabilityFG;
```

```
    MAP(i) = MAP_BG / sumBG * probabilityBG + MAP_FG / sumFG * probabilityFG;
end

figure;
plot(alpha, ML, '-o', 'DisplayName', 'ML');
hold on;
plot(alpha, MAP, '-s', 'DisplayName', 'MAP');
plot(alpha, PD, '-d', 'DisplayName', 'PD');
set(gca, 'XScale', 'log');
xlabel('log(\alpha)');
ylabel('Probability of Error');
title('Dataset 3 Strategy 1');
legend('Location', 'best', 'FontSize', 10);
set(gca);

% Dataset 4
[numSamplesBG, ~] = size(D4_BG);
[numSamplesFG, ~] = size(D4_FG);
probabilityBG = numSamplesBG / (numSamplesBG + numSamplesFG);
probabilityFG = numSamplesFG / (numSamplesBG + numSamplesFG);
backgroundMean = mean(D4_BG(:, 1:64), 1);
backgroundCovariance = (D4_BG(:, 1:64) - backgroundMean)' * (D4_BG(:, 1:64)
- backgroundMean) / numSamplesBG;
foregroundMean = mean(D4_FG(:, 1:64), 1);
foregroundCovariance = (D4_FG(:, 1:64) - foregroundMean)' * (D4_FG(:, 1:64)
- foregroundMean) / numSamplesFG;
priorCovariance = diag(W0);
index = 1;
zigzagPatternData = load('Zig-Zag Pattern.txt');
zigzagPattern = zigzagPatternData(:)' + 1;

for row = 1:m-7
    for col = 1:n-7
        featureMatrix(:, index) = reshape(dct2(double(cheetah_img(row:row+7,
col:col+7)) / 255.0)', [64, 1]);
        featureMatrix(zigzagPattern, index) = featureMatrix(:, index);
        index = index + 1;
    end
end

sumFG = sum(mask(:) == 255);
sumBG = numel(mask) - sumFG;
MAP = [];
ML = [];
PD = [];

for i = 1:9
    currentAlpha = alpha(i);
    adjustedPriorCovariance = currentAlpha * priorCovariance;
    updatedForegroundMean = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG)
* foregroundMean' + foregroundCovariance / numSamplesFG *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) * mu0_FG';
    updatedBackgroundMean = adjustedPriorCovariance *
```

```
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG)
* backgroundMean' + backgroundCovariance / numSamplesBG *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) * mu0_BG';
    updatedForegroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) *
foregroundCovariance / numSamplesFG;
    updatedBackgroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) *
backgroundCovariance / numSamplesBG;
    finalForegroundCovariance = updatedForegroundCovariance +
foregroundCovariance;
    finalBackgroundCovariance = updatedBackgroundCovariance +
backgroundCovariance;
    index = 1;
    PD_FG = 0;
    PD_BG = 0;
    ML_FG = 0;
    ML_BG = 0;
    MAP_FG = 0;
    MAP_BG = 0;

    for j = 1:m-7
        for h = 1:n-7
            X = featureMatrix(1:64, index);

            % Predictive
            i1_PD = -0.5 * (X - updatedBackgroundMean)' *
inv(finalBackgroundCovariance) * (X - updatedBackgroundMean) ...
                    - 0.5 * log((2 * pi)^64 *
det(finalBackgroundCovariance)) + log(probabilityBG);
            i2_PD = -0.5 * (X - updatedForegroundMean)' *
inv(finalForegroundCovariance) * (X - updatedForegroundMean) ...
                    - 0.5 * log((2 * pi)^64 *
det(finalForegroundCovariance)) + log(probabilityFG);

            if i1_PD > i2_PD
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                PD_BG = PD_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                PD_FG = PD_FG + 1;
            end


            % MAP
            i1_MAP = -0.5 * (X - updatedBackgroundMean)' *
inv(backgroundCovariance) * (X - updatedBackgroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
```

```
log(probabilityBG);

            i2_MAP = -0.5 * (X - updatedForegroundMean)' *
inv(foregroundCovariance) * (X - updatedForegroundMean) ...
                      - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);


            if i1_MAP > i2_MAP
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                MAP_BG = MAP_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                MAP_FG = MAP_FG + 1;
            end

            index = index + 1;


            % ML
            i1_ML = -0.5 * (X - backgroundMean')' *
inv(backgroundCovariance) * (X - backgroundMean') ...
                    - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
log(probabilityBG);
            i2_ML = -0.5 * (X - foregroundMean')' *
inv(foregroundCovariance) * (X - foregroundMean') ...
                    - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);

            if i1_ML > i2_ML
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                ML_BG = ML_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                ML_FG = ML_FG + 1;
            end

        end
    end

    PD(i) = PD_BG / sumBG * probabilityBG + PD_FG / sumFG * probabilityFG;
    ML(i) = ML_BG / sumBG * probabilityBG + ML_FG / sumFG * probabilityFG;
```

```
    MAP(i) = MAP_BG / sumBG * probabilityBG + MAP_FG / sumFG * probabilityFG;
end

figure;
plot(alpha, ML, '-o', 'DisplayName', 'ML');
hold on;
plot(alpha, MAP, '-s', 'DisplayName', 'MAP');
plot(alpha, PD, '-d', 'DisplayName', 'PD');
set(gca, 'XScale', 'log');
xlabel('log(\alpha)');
ylabel('Probability of Error');
title('Dataset 4 Strategy 1');
legend('Location', 'best', 'FontSize', 10);
set(gca);

% Strategy 2
clear;
load('TrainingSamplesDCT_subsets_8.mat')
cheetah_img=imread('cheetah.bmp');
mask=imread('cheetah_mask.bmp');
[m,n]=size(cheetah_img);
load('Prior_2.mat');
load('Alpha.mat');
alpha=load('Alpha.mat').alpha;

%Dataset 1
[numSamplesBG, ~] = size(D1_BG);
[numSamplesFG, ~] = size(D1_FG);
probabilityBG = numSamplesBG / (numSamplesBG + numSamplesFG);
probabilityFG = numSamplesFG / (numSamplesBG + numSamplesFG);
backgroundMean = mean(D1_BG(:, 1:64), 1);
backgroundCovariance = (D1_BG(:, 1:64) - backgroundMean)' * (D1_BG(:, 1:64)
- backgroundMean) / numSamplesBG;
foregroundMean = mean(D1_FG(:, 1:64), 1);
foregroundCovariance = (D1_FG(:, 1:64) - foregroundMean)' * (D1_FG(:, 1:64)
- foregroundMean) / numSamplesFG;
priorCovariance = diag(W0);
index = 1;
zigzagPatternData = load('Zig-Zag Pattern.txt');
zigzagPattern = zigzagPatternData(:)' + 1;

for row = 1:m-7
    for col = 1:n-7
        featureMatrix(:, index) = reshape(dct2(double(cheetah_img(row:row+7,
col:col+7)) / 255.0)', [64, 1]);
        featureMatrix(zigzagPattern, index) = featureMatrix(:, index);
        index = index + 1;
    end
end

sumFG = sum(mask(:) == 255);
sumBG = numel(mask) - sumFG;
MAP = [];
ML = [];
```

```
PD = [];

for i = 1:9
    currentAlpha = alpha(i);
    adjustedPriorCovariance = currentAlpha * priorCovariance;
    updatedForegroundMean = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG)
* foregroundMean' + foregroundCovariance / numSamplesFG *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) * mu0_FG';
    updatedBackgroundMean = adjustedPriorCovariance *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG)
* backgroundMean' + backgroundCovariance / numSamplesBG *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) * mu0_BG';
    updatedForegroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) *
foregroundCovariance / numSamplesFG;
    updatedBackgroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) *
backgroundCovariance / numSamplesBG;
    finalForegroundCovariance = updatedForegroundCovariance +
foregroundCovariance;
    finalBackgroundCovariance = updatedBackgroundCovariance +
backgroundCovariance;
    index = 1;
    PD_FG = 0;
    PD_BG = 0;
    ML_FG = 0;
    ML_BG = 0;
    MAP_FG = 0;
    MAP_BG = 0;

    for j = 1:m-7
        for h = 1:n-7
            X = featureMatrix(1:64, index);

            % Predictive
            i1_PD = -0.5 * (X - updatedBackgroundMean)' *
inv(finalBackgroundCovariance) * (X - updatedBackgroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(finalBackgroundCovariance))
+ log(probabilityBG);
            i2_PD = -0.5 * (X - updatedForegroundMean)' *
inv(finalForegroundCovariance) * (X - updatedForegroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(finalForegroundCovariance))
+ log(probabilityFG);

            if i1_PD > i2_PD
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                PD_BG = PD_BG + 1;
            end
```

```
            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                PD_FG = PD_FG + 1;
            end


            % MAP
            i1_MAP = -0.5 * (X - updatedBackgroundMean)' *
inv(backgroundCovariance) * (X - updatedBackgroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
log(probabilityBG);

            i2_MAP = -0.5 * (X - updatedForegroundMean)' *
inv(foregroundCovariance) * (X - updatedForegroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);


            if i1_MAP > i2_MAP
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                MAP_BG = MAP_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                MAP_FG = MAP_FG + 1;
            end

            index = index + 1;


            % ML
            i1_ML = -0.5 * (X - backgroundMean')' *
inv(backgroundCovariance) * (X - backgroundMean') ...
                    - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
log(probabilityBG);
            i2_ML = -0.5 * (X - foregroundMean')' *
inv(foregroundCovariance) * (X - foregroundMean') ...
                    - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);

            if i1_ML > i2_ML
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                ML_BG = ML_BG + 1;
            end
```

```
            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                ML_FG = ML_FG + 1;
            end

        end
    end

    PD(i) = PD_BG / sumBG * probabilityBG + PD_FG / sumFG * probabilityFG;
    ML(i) = ML_BG / sumBG * probabilityBG + ML_FG / sumFG * probabilityFG;
    MAP(i) = MAP_BG / sumBG * probabilityBG + MAP_FG / sumFG * probabilityFG;
end

figure;
plot(alpha, ML, '-o', 'DisplayName', 'ML');
hold on;
plot(alpha, MAP, '-s', 'DisplayName', 'MAP');
plot(alpha, PD, '-d', 'DisplayName', 'PD');
set(gca, 'XScale', 'log');
xlabel('log(\alpha)');
ylabel('Probability of Error');
title('Dataset 1 Strategy 2');
legend('Location', 'best', 'FontSize', 10);
set(gca);


%  %Dataset 2
[numSamplesBG, ~] = size(D2_BG);
[numSamplesFG, ~] = size(D2_FG);
probabilityBG = numSamplesBG / (numSamplesBG + numSamplesFG);
probabilityFG = numSamplesFG / (numSamplesBG + numSamplesFG);
backgroundMean = mean(D2_BG(:, 1:64), 1);
backgroundCovariance = (D2_BG(:, 1:64) - backgroundMean)' * (D2_BG(:, 1:64)
- backgroundMean) / numSamplesBG;
foregroundMean = mean(D2_FG(:, 1:64), 1);
foregroundCovariance = (D2_FG(:, 1:64) - foregroundMean)' * (D2_FG(:, 1:64)
- foregroundMean) / numSamplesFG;
priorCovariance = diag(W0);
index = 1;
zigzagPatternData = load('Zig-Zag Pattern.txt');
zigzagPattern = zigzagPatternData(:)' + 1;

for row = 1:m-7
    for col = 1:n-7
        featureMatrix(:, index) = reshape(dct2(double(cheetah_img(row:row+7,
col:col+7)) / 255.0)', [64, 1]);
        featureMatrix(zigzagPattern, index) = featureMatrix(:, index);
        index = index + 1;
    end
end

sumFG = sum(mask(:) == 255);
sumBG = numel(mask) - sumFG;
MAP = [];
```

```
ML = [];
PD = [];

for i = 1:9
    currentAlpha = alpha(i);
    adjustedPriorCovariance = currentAlpha * priorCovariance;
    updatedForegroundMean = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG)
* foregroundMean' + foregroundCovariance / numSamplesFG *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) * mu0_FG';
    updatedBackgroundMean = adjustedPriorCovariance *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG)
* backgroundMean' + backgroundCovariance / numSamplesBG *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) * mu0_BG';
    updatedForegroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) *
foregroundCovariance / numSamplesFG;
    updatedBackgroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) *
backgroundCovariance / numSamplesBG;
    finalForegroundCovariance = updatedForegroundCovariance +
foregroundCovariance;
    finalBackgroundCovariance = updatedBackgroundCovariance +
backgroundCovariance;
    index = 1;
    PD_FG = 0;
    PD_BG = 0;
    ML_FG = 0;
    ML_BG = 0;
    MAP_FG = 0;
    MAP_BG = 0;

    for j = 1:m-7
        for h = 1:n-7
            X = featureMatrix(1:64, index);

            % Predictive
            i1_PD = -0.5 * (X - updatedBackgroundMean)' *
inv(finalBackgroundCovariance) * (X - updatedBackgroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(finalBackgroundCovariance))
+ log(probabilityBG);
            i2_PD = -0.5 * (X - updatedForegroundMean)' *
inv(finalForegroundCovariance) * (X - updatedForegroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(finalForegroundCovariance))
+ log(probabilityFG);

            if i1_PD > i2_PD
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                PD_BG = PD_BG + 1;
```

```
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                PD_FG = PD_FG + 1;
            end


            % MAP
            i1_MAP = -0.5 * (X - updatedBackgroundMean)' *
inv(backgroundCovariance) * (X - updatedBackgroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
log(probabilityBG);

            i2_MAP = -0.5 * (X - updatedForegroundMean)' *
inv(foregroundCovariance) * (X - updatedForegroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);


            if i1_MAP > i2_MAP
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                MAP_BG = MAP_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                MAP_FG = MAP_FG + 1;
            end

            index = index + 1;


            % ML
            i1_ML = -0.5 * (X - backgroundMean')' *
inv(backgroundCovariance) * (X - backgroundMean') ...
                    - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
log(probabilityBG);
            i2_ML = -0.5 * (X - foregroundMean')' *
inv(foregroundCovariance) * (X - foregroundMean') ...
                    - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);

            if i1_ML > i2_ML
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
                ML_BG = ML_BG + 1;
```

```
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                ML_FG = ML_FG + 1;
            end

        end
    end

    PD(i) = PD_BG / sumBG * probabilityBG + PD_FG / sumFG * probabilityFG;
    ML(i) = ML_BG / sumBG * probabilityBG + ML_FG / sumFG * probabilityFG;
    MAP(i) = MAP_BG / sumBG * probabilityBG + MAP_FG / sumFG * probabilityFG;
end

figure;
plot(alpha, ML, '-o', 'DisplayName', 'ML');
hold on;
plot(alpha, MAP, '-s', 'DisplayName', 'MAP');
plot(alpha, PD, '-d', 'DisplayName', 'PD');
set(gca, 'XScale', 'log');
xlabel('log(\alpha)');
ylabel('Probability of Error');
title('Dataset 2 Strategy 2');
legend('Location', 'best', 'FontSize', 10);
set(gca);


%Dataset 3
[numSamplesBG, ~] = size(D3_BG);
[numSamplesFG, ~] = size(D3_FG);
probabilityBG = numSamplesBG / (numSamplesBG + numSamplesFG);
probabilityFG = numSamplesFG / (numSamplesBG + numSamplesFG);
backgroundMean = mean(D3_BG(:, 1:64), 1);
backgroundCovariance = (D3_BG(:, 1:64) - backgroundMean)' * (D3_BG(:, 1:64)
- backgroundMean) / numSamplesBG;
foregroundMean = mean(D3_FG(:, 1:64), 1);
foregroundCovariance = (D3_FG(:, 1:64) - foregroundMean)' * (D3_FG(:, 1:64)
- foregroundMean) / numSamplesFG;
priorCovariance = diag(W0);
index = 1;
zigzagPatternData = load('Zig-Zag Pattern.txt');
zigzagPattern = zigzagPatternData(:)' + 1;

for row = 1:m-7
    for col = 1:n-7
        featureMatrix(:, index) = reshape(dct2(double(cheetah_img(row:row+7,
col:col+7)) / 255.0)', [64, 1]);
        featureMatrix(zigzagPattern, index) = featureMatrix(:, index);
        index = index + 1;
    end
end

sumFG = sum(mask(:) == 255);
sumBG = numel(mask) - sumFG;
```

```
MAP = [];
ML = [];
PD = [];

for i = 1:9
    currentAlpha = alpha(i);
    adjustedPriorCovariance = currentAlpha * priorCovariance;
    updatedForegroundMean = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG)
* foregroundMean' + foregroundCovariance / numSamplesFG *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) * mu0_FG';
    updatedBackgroundMean = adjustedPriorCovariance *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG)
* backgroundMean' + backgroundCovariance / numSamplesBG *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) * mu0_BG';
    updatedForegroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) *
foregroundCovariance / numSamplesFG;
    updatedBackgroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) *
backgroundCovariance / numSamplesBG;
    finalForegroundCovariance = updatedForegroundCovariance +
foregroundCovariance;
    finalBackgroundCovariance = updatedBackgroundCovariance +
backgroundCovariance;
    index = 1;
    PD_FG = 0;
    PD_BG = 0;
    ML_FG = 0;
    ML_BG = 0;
    MAP_FG = 0;
    MAP_BG = 0;

    for j = 1:m-7
        for h = 1:n-7
            X = featureMatrix(1:64, index);

            % Predictive
            i1_PD = -0.5 * (X - updatedBackgroundMean)' *
inv(finalBackgroundCovariance) * (X - updatedBackgroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(finalBackgroundCovariance))
+ log(probabilityBG);
            i2_PD = -0.5 * (X - updatedForegroundMean)' *
inv(finalForegroundCovariance) * (X - updatedForegroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(finalForegroundCovariance))
+ log(probabilityFG);

            if i1_PD > i2_PD
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
```

```
            PD_BG = PD_BG + 1;
        end

        if uint8(A(j, h)) == 0 && mask(j, h) == 255
            PD_FG = PD_FG + 1;
        end


        % MAP
        i1_MAP = -0.5 * (X - updatedBackgroundMean)' *
inv(backgroundCovariance) * (X - updatedBackgroundMean) ...
                 - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
log(probabilityBG);

        i2_MAP = -0.5 * (X - updatedForegroundMean)' *
inv(foregroundCovariance) * (X - updatedForegroundMean) ...
                 - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);


        if i1_MAP > i2_MAP
            A(j, h) = 0;
        else
            A(j, h) = 255;
        end

        if uint8(A(j, h)) == 255 && mask(j, h) == 0
            MAP_BG = MAP_BG + 1;
        end

        if uint8(A(j, h)) == 0 && mask(j, h) == 255
            MAP_FG = MAP_FG + 1;
        end

        index = index + 1;


        % ML
        i1_ML = -0.5 * (X - backgroundMean')' *
inv(backgroundCovariance) * (X - backgroundMean') ...
                - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
log(probabilityBG);
        i2_ML = -0.5 * (X - foregroundMean')' *
inv(foregroundCovariance) * (X - foregroundMean') ...
                - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);

        if i1_ML > i2_ML
            A(j, h) = 0;
        else
            A(j, h) = 255;
        end

        if uint8(A(j, h)) == 255 && mask(j, h) == 0
```

```
                ML_BG = ML_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                ML_FG = ML_FG + 1;
            end

        end
    end

    PD(i) = PD_BG / sumBG * probabilityBG + PD_FG / sumFG * probabilityFG;
    ML(i) = ML_BG / sumBG * probabilityBG + ML_FG / sumFG * probabilityFG;
    MAP(i) = MAP_BG / sumBG * probabilityBG + MAP_FG / sumFG * probabilityFG;
end

figure;
plot(alpha, ML, '-o', 'DisplayName', 'ML');
hold on;
plot(alpha, MAP, '-s', 'DisplayName', 'MAP');
plot(alpha, PD, '-d', 'DisplayName', 'PD');
set(gca, 'XScale', 'log');
xlabel('log(\alpha)');
ylabel('Probability of Error');
title('Dataset 3 Strategy 2');
legend('Location', 'best', 'FontSize', 10);
set(gca);

% Dataset 4
[numSamplesBG, ~] = size(D4_BG);
[numSamplesFG, ~] = size(D4_FG);
probabilityBG = numSamplesBG / (numSamplesBG + numSamplesFG);
probabilityFG = numSamplesFG / (numSamplesBG + numSamplesFG);
backgroundMean = mean(D4_BG(:, 1:64), 1);
backgroundCovariance = (D4_BG(:, 1:64) - backgroundMean)' * (D4_BG(:, 1:64)
- backgroundMean) / numSamplesBG;
foregroundMean = mean(D4_FG(:, 1:64), 1);
foregroundCovariance = (D4_FG(:, 1:64) - foregroundMean)' * (D4_FG(:, 1:64)
- foregroundMean) / numSamplesFG;
priorCovariance = diag(W0);
index = 1;
zigzagPatternData = load('Zig-Zag Pattern.txt');
zigzagPattern = zigzagPatternData(:)' + 1;

for row = 1:m-7
    for col = 1:n-7
        featureMatrix(:, index) = reshape(dct2(double(cheetah_img(row:row+7,
col:col+7)) / 255.0)', [64, 1]);
        featureMatrix(zigzagPattern, index) = featureMatrix(:, index);
        index = index + 1;
    end
end

sumFG = sum(mask(:) == 255);
sumBG = numel(mask) - sumFG;
```

```
MAP = [];
ML = [];
PD = [];

for i = 1:9
    currentAlpha = alpha(i);
    adjustedPriorCovariance = currentAlpha * priorCovariance;
    updatedForegroundMean = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG)
* foregroundMean' + foregroundCovariance / numSamplesFG *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) * mu0_FG';
    updatedBackgroundMean = adjustedPriorCovariance *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG)
* backgroundMean' + backgroundCovariance / numSamplesBG *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) * mu0_BG';
    updatedForegroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + foregroundCovariance / numSamplesFG) *
foregroundCovariance / numSamplesFG;
    updatedBackgroundCovariance = adjustedPriorCovariance *
inv(adjustedPriorCovariance + backgroundCovariance / numSamplesBG) *
backgroundCovariance / numSamplesBG;
    finalForegroundCovariance = updatedForegroundCovariance +
foregroundCovariance;
    finalBackgroundCovariance = updatedBackgroundCovariance +
backgroundCovariance;
    index = 1;
    PD_FG = 0;
    PD_BG = 0;
    ML_FG = 0;
    ML_BG = 0;
    MAP_FG = 0;
    MAP_BG = 0;

    for j = 1:m-7
        for h = 1:n-7
            X = featureMatrix(1:64, index);

            % Predictive
            i1_PD = -0.5 * (X - updatedBackgroundMean)' *
inv(finalBackgroundCovariance) * (X - updatedBackgroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(finalBackgroundCovariance))
+ log(probabilityBG);
            i2_PD = -0.5 * (X - updatedForegroundMean)' *
inv(finalForegroundCovariance) * (X - updatedForegroundMean) ...
                    - 0.5 * log((2 * pi)^64 * det(finalForegroundCovariance))
+ log(probabilityFG);

            if i1_PD > i2_PD
                A(j, h) = 0;
            else
                A(j, h) = 255;
            end

            if uint8(A(j, h)) == 255 && mask(j, h) == 0
```

```
            PD_BG = PD_BG + 1;
        end

        if uint8(A(j, h)) == 0 && mask(j, h) == 255
            PD_FG = PD_FG + 1;
        end


        % MAP
        i1_MAP = -0.5 * (X - updatedBackgroundMean)' *
inv(backgroundCovariance) * (X - updatedBackgroundMean) ...
                 - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
log(probabilityBG);

        i2_MAP = -0.5 * (X - updatedForegroundMean)' *
inv(foregroundCovariance) * (X - updatedForegroundMean) ...
                 - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);


        if i1_MAP > i2_MAP
            A(j, h) = 0;
        else
            A(j, h) = 255;
        end

        if uint8(A(j, h)) == 255 && mask(j, h) == 0
            MAP_BG = MAP_BG + 1;
        end

        if uint8(A(j, h)) == 0 && mask(j, h) == 255
            MAP_FG = MAP_FG + 1;
        end

        index = index + 1;


        % ML
        i1_ML = -0.5 * (X - backgroundMean')' *
inv(backgroundCovariance) * (X - backgroundMean') ...
                - 0.5 * log((2 * pi)^64 * det(backgroundCovariance)) +
log(probabilityBG);
        i2_ML = -0.5 * (X - foregroundMean')' *
inv(foregroundCovariance) * (X - foregroundMean') ...
                - 0.5 * log((2 * pi)^64 * det(foregroundCovariance)) +
log(probabilityFG);

        if i1_ML > i2_ML
            A(j, h) = 0;
        else
            A(j, h) = 255;
        end

        if uint8(A(j, h)) == 255 && mask(j, h) == 0
```

```
                ML_BG = ML_BG + 1;
            end

            if uint8(A(j, h)) == 0 && mask(j, h) == 255
                ML_FG = ML_FG + 1;
            end

        end
    end

    PD(i) = PD_BG / sumBG * probabilityBG + PD_FG / sumFG * probabilityFG;
    ML(i) = ML_BG / sumBG * probabilityBG + ML_FG / sumFG * probabilityFG;
    MAP(i) = MAP_BG / sumBG * probabilityBG + MAP_FG / sumFG * probabilityFG;
end

figure;
plot(alpha, ML, '-o', 'DisplayName', 'ML');
hold on;
plot(alpha, MAP, '-s', 'DisplayName', 'MAP');
plot(alpha, PD, '-d', 'DisplayName', 'PD');
set(gca, 'XScale', 'log');
xlabel('log(\alpha)');
ylabel('Probability of Error');
title('Dataset 4 Strategy 2');
legend('Location', 'best', 'FontSize', 10);
set(gca);
```

```
                      ALim: {}
                   ALimMode: {'auto'  'manual'}
                 AlphaScale: {'linear'  'log'}
                   Alphamap: {}
           AmbientLightColor: {1×0 cell}
                        Box: {[on]  [off]}
                  BoxStyle: {'full'  'back'}
                BusyAction: {'queue'  'cancel'}
             ButtonDownFcn: {}
                      CLim: {}
                   CLimMode: {'auto'  'manual'}
              CameraPosition: {}
            CameraPositionMode: {'auto'  'manual'}
                 CameraTarget: {}
               CameraTargetMode: {'auto'  'manual'}
                 CameraUpVector: {}
             CameraUpVectorMode: {'auto'  'manual'}
                CameraViewAngle: {}
            CameraViewAngleMode: {'auto'  'manual'}
                    Children: {}
                    Clipping: {[on]  [off]}
                ClippingStyle: {'rectangle'  '3dbox'}
                        Color: {1×0 cell}
                   ColorOrder: {}
               ColorOrderIndex: {}
                    ColorScale: {'linear'  'log'}
                      Colormap: {}
```

```
            ContextMenu: {}
              CreateFcn: {}
         DataAspectRatio: {}
     DataAspectRatioMode: {'auto'  'manual'}
              DeleteFcn: {}
              FontAngle: {'normal'  'italic'}
               FontName: {}
               FontSize: {}
           FontSizeMode: {'auto'  'manual'}
         FontSmoothing: {[on]  [off]}
             FontUnits: {1×5 cell}
            FontWeight: {'normal'  'bold'}
             GridAlpha: {}
         GridAlphaMode: {'auto'  'manual'}
             GridColor: {1×0 cell}
         GridColorMode: {'auto'  'manual'}
         GridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
         GridLineWidth: {}
       GridLineWidthMode: {'auto'  'manual'}
        HandleVisibility: {'on'  'callback'  'off'}
                 HitTest: {[on]  [off]}
           InnerPosition: {}
      InteractionOptions: {}
            Interactions: {}
           Interruptible: {[on]  [off]}
 LabelFontSizeMultiplier: {}
                   Layer: {'bottom'  'top'}
                  Layout: {}
 LineStyleCyclingMethod: {'aftercolor'  'beforecolor'  'withcolor'}
         LineStyleOrder: {}
    LineStyleOrderIndex: {}
              LineWidth: {}
          MinorGridAlpha: {}
      MinorGridAlphaMode: {'auto'  'manual'}
          MinorGridColor: {1×0 cell}
      MinorGridColorMode: {'auto'  'manual'}
      MinorGridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
      MinorGridLineWidth: {}
 MinorGridLineWidthMode: {'auto'  'manual'}
                NextPlot: {1×4 cell}
           OuterPosition: {}
                  Parent: {}
           PickableParts: {'visible'  'none'  'all'}
      PlotBoxAspectRatio: {}
 PlotBoxAspectRatioMode: {'auto'  'manual'}
                Position: {}
      PositionConstraint: {'innerposition'  'outerposition'}
              Projection: {'orthographic'  'perspective'}
                Selected: {[on]  [off]}
      SelectionHighlight: {[on]  [off]}
              SortMethod: {'depth'  'childorder'}
                Subtitle: {}
      SubtitleFontWeight: {'normal'  'bold'}
                     Tag: {}
```

```
                TickDir: {'in'  'out'  'both'  'none'}
             TickDirMode: {'auto'  'manual'}
    TickLabelInterpreter: {'none'  'tex'  'latex'}
              TickLength: {}
                   Title: {}
 TitleFontSizeMultiplier: {}
         TitleFontWeight: {'normal'  'bold'}
TitleHorizontalAlignment: {'left'  'center'  'right'}
                 Toolbar: {}
                   Units: {1×6 cell}
                UserData: {}
                    View: {}
                 Visible: {[on]  [off]}
                   XAxis: {}
           XAxisLocation: {'bottom'  'top'  'origin'}
                  XColor: {1×0 cell}
             XColorMode: {'auto'  'manual'}
                   XDir: {'normal'  'reverse'}
                 XGrid: {[on]  [off]}
                 XLabel: {}
                   XLim: {}
              XLimMode: {'auto'  'manual'}
           XLimitMethod: {'tickaligned'  'tight'  'padded'}
             XMinorGrid: {[on]  [off]}
             XMinorTick: {[on]  [off]}
                 XScale: {'linear'  'log'}
                  XTick: {}
             XTickLabel: {}
          XTickLabelMode: {'auto'  'manual'}
      XTickLabelRotation: {}
  XTickLabelRotationMode: {'auto'  'manual'}
              XTickMode: {'auto'  'manual'}
           YAxisLocation: {'left'  'right'  'origin'}
                  YColor: {1×0 cell}
             YColorMode: {'auto'  'manual'}
                   YDir: {'normal'  'reverse'}
                 YGrid: {[on]  [off]}
                 YLabel: {}
                   YLim: {}
              YLimMode: {'auto'  'manual'}
           YLimitMethod: {'tickaligned'  'tight'  'padded'}
             YMinorGrid: {[on]  [off]}
             YMinorTick: {[on]  [off]}
                 YScale: {'linear'  'log'}
                  YTick: {}
             YTickLabel: {}
          YTickLabelMode: {'auto'  'manual'}
      YTickLabelRotation: {}
  YTickLabelRotationMode: {'auto'  'manual'}
              YTickMode: {'auto'  'manual'}
                   ZAxis: {}
                  ZColor: {1×0 cell}
             ZColorMode: {'auto'  'manual'}
                   ZDir: {'normal'  'reverse'}
```

```
                ZGrid: {[on]  [off]}
               ZLabel: {}
                ZLim: {}
             ZLimMode: {'auto'  'manual'}
         ZLimitMethod: {'tickaligned'  'tight'  'padded'}
           ZMinorGrid: {[on]  [off]}
           ZMinorTick: {[on]  [off]}
               ZScale: {'linear'  'log'}
                ZTick: {}
             ZTickLabel: {}
        ZTickLabelMode: {'auto'  'manual'}
    ZTickLabelRotation: {}
ZTickLabelRotationMode: {'auto'  'manual'}
            ZTickMode: {'auto'  'manual'}

                ALim: {}
             ALimMode: {'auto'  'manual'}
           AlphaScale: {'linear'  'log'}
             Alphamap: {}
     AmbientLightColor: {1×0 cell}
                  Box: {[on]  [off]}
             BoxStyle: {'full'  'back'}
           BusyAction: {'queue'  'cancel'}
         ButtonDownFcn: {}
                CLim: {}
             CLimMode: {'auto'  'manual'}
       CameraPosition: {}
    CameraPositionMode: {'auto'  'manual'}
        CameraTarget: {}
      CameraTargetMode: {'auto'  'manual'}
        CameraUpVector: {}
    CameraUpVectorMode: {'auto'  'manual'}
       CameraViewAngle: {}
   CameraViewAngleMode: {'auto'  'manual'}
            Children: {}
            Clipping: {[on]  [off]}
       ClippingStyle: {'rectangle'  '3dbox'}
               Color: {1×0 cell}
          ColorOrder: {}
      ColorOrderIndex: {}
          ColorScale: {'linear'  'log'}
            Colormap: {}
         ContextMenu: {}
           CreateFcn: {}
       DataAspectRatio: {}
   DataAspectRatioMode: {'auto'  'manual'}
           DeleteFcn: {}
           FontAngle: {'normal'  'italic'}
            FontName: {}
            FontSize: {}
        FontSizeMode: {'auto'  'manual'}
       FontSmoothing: {[on]  [off]}
           FontUnits: {1×5 cell}
          FontWeight: {'normal'  'bold'}
```

```
                GridAlpha: {}
           GridAlphaMode: {'auto'  'manual'}
               GridColor: {1×0 cell}
           GridColorMode: {'auto'  'manual'}
           GridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
           GridLineWidth: {}
       GridLineWidthMode: {'auto'  'manual'}
        HandleVisibility: {'on'  'callback'  'off'}
                 HitTest: {[on]  [off]}
           InnerPosition: {}
      InteractionOptions: {}
            Interactions: {}
           Interruptible: {[on]  [off]}
 LabelFontSizeMultiplier: {}
                   Layer: {'bottom'  'top'}
                  Layout: {}
  LineStyleCyclingMethod: {'aftercolor'  'beforecolor'  'withcolor'}
         LineStyleOrder: {}
    LineStyleOrderIndex: {}
               LineWidth: {}
           MinorGridAlpha: {}
       MinorGridAlphaMode: {'auto'  'manual'}
           MinorGridColor: {1×0 cell}
       MinorGridColorMode: {'auto'  'manual'}
       MinorGridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
       MinorGridLineWidth: {}
  MinorGridLineWidthMode: {'auto'  'manual'}
                NextPlot: {1×4 cell}
           OuterPosition: {}
                  Parent: {}
           PickableParts: {'visible'  'none'  'all'}
       PlotBoxAspectRatio: {}
  PlotBoxAspectRatioMode: {'auto'  'manual'}
                Position: {}
      PositionConstraint: {'innerposition'  'outerposition'}
              Projection: {'orthographic'  'perspective'}
                Selected: {[on]  [off]}
      SelectionHighlight: {[on]  [off]}
              SortMethod: {'depth'  'childorder'}
                Subtitle: {}
      SubtitleFontWeight: {'normal'  'bold'}
                     Tag: {}
                 TickDir: {'in'  'out'  'both'  'none'}
             TickDirMode: {'auto'  'manual'}
    TickLabelInterpreter: {'none'  'tex'  'latex'}
             TickLength: {}
                   Title: {}
 TitleFontSizeMultiplier: {}
         TitleFontWeight: {'normal'  'bold'}
 TitleHorizontalAlignment: {'left'  'center'  'right'}
                 Toolbar: {}
                   Units: {1×6 cell}
                UserData: {}
                    View: {}
```

```
                Visible: {[on]  [off]}
                  XAxis: {}
           XAxisLocation: {'bottom'  'top'  'origin'}
                 XColor: {1×0 cell}
              XColorMode: {'auto'  'manual'}
                   XDir: {'normal'  'reverse'}
                  XGrid: {[on]  [off]}
                 XLabel: {}
                   XLim: {}
               XLimMode: {'auto'  'manual'}
            XLimitMethod: {'tickaligned'  'tight'  'padded'}
              XMinorGrid: {[on]  [off]}
              XMinorTick: {[on]  [off]}
                  XScale: {'linear'  'log'}
                  XTick: {}
              XTickLabel: {}
          XTickLabelMode: {'auto'  'manual'}
      XTickLabelRotation: {}
  XTickLabelRotationMode: {'auto'  'manual'}
               XTickMode: {'auto'  'manual'}
           YAxisLocation: {'left'  'right'  'origin'}
                 YColor: {1×0 cell}
              YColorMode: {'auto'  'manual'}
                   YDir: {'normal'  'reverse'}
                  YGrid: {[on]  [off]}
                 YLabel: {}
                   YLim: {}
               YLimMode: {'auto'  'manual'}
            YLimitMethod: {'tickaligned'  'tight'  'padded'}
              YMinorGrid: {[on]  [off]}
              YMinorTick: {[on]  [off]}
                  YScale: {'linear'  'log'}
                  YTick: {}
              YTickLabel: {}
          YTickLabelMode: {'auto'  'manual'}
      YTickLabelRotation: {}
  YTickLabelRotationMode: {'auto'  'manual'}
               YTickMode: {'auto'  'manual'}
                   ZAxis: {}
                 ZColor: {1×0 cell}
              ZColorMode: {'auto'  'manual'}
                   ZDir: {'normal'  'reverse'}
                  ZGrid: {[on]  [off]}
                 ZLabel: {}
                   ZLim: {}
               ZLimMode: {'auto'  'manual'}
            ZLimitMethod: {'tickaligned'  'tight'  'padded'}
              ZMinorGrid: {[on]  [off]}
              ZMinorTick: {[on]  [off]}
                  ZScale: {'linear'  'log'}
                  ZTick: {}
              ZTickLabel: {}
          ZTickLabelMode: {'auto'  'manual'}
      ZTickLabelRotation: {}
```

```
ZTickLabelRotationMode: {'auto'  'manual'}
           ZTickMode: {'auto'  'manual'}

                ALim: {}
            ALimMode: {'auto'  'manual'}
          AlphaScale: {'linear'  'log'}
            Alphamap: {}
    AmbientLightColor: {1×0 cell}
                 Box: {[on]  [off]}
            BoxStyle: {'full'  'back'}
          BusyAction: {'queue'  'cancel'}
        ButtonDownFcn: {}
                CLim: {}
            CLimMode: {'auto'  'manual'}
       CameraPosition: {}
   CameraPositionMode: {'auto'  'manual'}
        CameraTarget: {}
     CameraTargetMode: {'auto'  'manual'}
       CameraUpVector: {}
   CameraUpVectorMode: {'auto'  'manual'}
      CameraViewAngle: {}
  CameraViewAngleMode: {'auto'  'manual'}
            Children: {}
            Clipping: {[on]  [off]}
        ClippingStyle: {'rectangle'  '3dbox'}
                Color: {1×0 cell}
           ColorOrder: {}
      ColorOrderIndex: {}
           ColorScale: {'linear'  'log'}
             Colormap: {}
          ContextMenu: {}
            CreateFcn: {}
      DataAspectRatio: {}
  DataAspectRatioMode: {'auto'  'manual'}
            DeleteFcn: {}
            FontAngle: {'normal'  'italic'}
             FontName: {}
             FontSize: {}
         FontSizeMode: {'auto'  'manual'}
       FontSmoothing: {[on]  [off]}
            FontUnits: {1×5 cell}
           FontWeight: {'normal'  'bold'}
            GridAlpha: {}
       GridAlphaMode: {'auto'  'manual'}
            GridColor: {1×0 cell}
       GridColorMode: {'auto'  'manual'}
       GridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
       GridLineWidth: {}
    GridLineWidthMode: {'auto'  'manual'}
     HandleVisibility: {'on'  'callback'  'off'}
              HitTest: {[on]  [off]}
        InnerPosition: {}
    InteractionOptions: {}
         Interactions: {}
```

```
          Interruptible: {[on]  [off]}
LabelFontSizeMultiplier: {}
                  Layer: {'bottom'  'top'}
                 Layout: {}
 LineStyleCyclingMethod: {'aftercolor'  'beforecolor'  'withcolor'}
         LineStyleOrder: {}
    LineStyleOrderIndex: {}
              LineWidth: {}
         MinorGridAlpha: {}
     MinorGridAlphaMode: {'auto'  'manual'}
         MinorGridColor: {1×0 cell}
     MinorGridColorMode: {'auto'  'manual'}
     MinorGridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
     MinorGridLineWidth: {}
 MinorGridLineWidthMode: {'auto'  'manual'}
               NextPlot: {1×4 cell}
          OuterPosition: {}
                 Parent: {}
          PickableParts: {'visible'  'none'  'all'}
     PlotBoxAspectRatio: {}
 PlotBoxAspectRatioMode: {'auto'  'manual'}
               Position: {}
     PositionConstraint: {'innerposition'  'outerposition'}
             Projection: {'orthographic'  'perspective'}
               Selected: {[on]  [off]}
     SelectionHighlight: {[on]  [off]}
             SortMethod: {'depth'  'childorder'}
               Subtitle: {}
     SubtitleFontWeight: {'normal'  'bold'}
                    Tag: {}
                TickDir: {'in'  'out'  'both'  'none'}
            TickDirMode: {'auto'  'manual'}
   TickLabelInterpreter: {'none'  'tex'  'latex'}
             TickLength: {}
                  Title: {}
 TitleFontSizeMultiplier: {}
        TitleFontWeight: {'normal'  'bold'}
TitleHorizontalAlignment: {'left'  'center'  'right'}
                Toolbar: {}
                  Units: {1×6 cell}
               UserData: {}
                   View: {}
                Visible: {[on]  [off]}
                  XAxis: {}
          XAxisLocation: {'bottom'  'top'  'origin'}
                 XColor: {1×0 cell}
             XColorMode: {'auto'  'manual'}
                   XDir: {'normal'  'reverse'}
                 XGrid: {[on]  [off]}
                XLabel: {}
                  XLim: {}
               XLimMode: {'auto'  'manual'}
           XLimitMethod: {'tickaligned'  'tight'  'padded'}
             XMinorGrid: {[on]  [off]}
```

```
            XMinorTick: {[on]  [off]}
                XScale: {'linear'  'log'}
                 XTick: {}
             XTickLabel: {}
         XTickLabelMode: {'auto'  'manual'}
     XTickLabelRotation: {}
 XTickLabelRotationMode: {'auto'  'manual'}
              XTickMode: {'auto'  'manual'}
          YAxisLocation: {'left'  'right'  'origin'}
                 YColor: {1×0 cell}
             YColorMode: {'auto'  'manual'}
                   YDir: {'normal'  'reverse'}
                 YGrid: {[on]  [off]}
                YLabel: {}
                  YLim: {}
              YLimMode: {'auto'  'manual'}
           YLimitMethod: {'tickaligned'  'tight'  'padded'}
             YMinorGrid: {[on]  [off]}
             YMinorTick: {[on]  [off]}
                 YScale: {'linear'  'log'}
                  YTick: {}
             YTickLabel: {}
         YTickLabelMode: {'auto'  'manual'}
     YTickLabelRotation: {}
 YTickLabelRotationMode: {'auto'  'manual'}
              YTickMode: {'auto'  'manual'}
                  ZAxis: {}
                 ZColor: {1×0 cell}
             ZColorMode: {'auto'  'manual'}
                   ZDir: {'normal'  'reverse'}
                 ZGrid: {[on]  [off]}
                ZLabel: {}
                  ZLim: {}
              ZLimMode: {'auto'  'manual'}
           ZLimitMethod: {'tickaligned'  'tight'  'padded'}
             ZMinorGrid: {[on]  [off]}
             ZMinorTick: {[on]  [off]}
                 ZScale: {'linear'  'log'}
                  ZTick: {}
             ZTickLabel: {}
         ZTickLabelMode: {'auto'  'manual'}
     ZTickLabelRotation: {}
 ZTickLabelRotationMode: {'auto'  'manual'}
              ZTickMode: {'auto'  'manual'}

                   ALim: {}
               ALimMode: {'auto'  'manual'}
             AlphaScale: {'linear'  'log'}
               Alphamap: {}
      AmbientLightColor: {1×0 cell}
                    Box: {[on]  [off]}
              BoxStyle: {'full'  'back'}
             BusyAction: {'queue'  'cancel'}
          ButtonDownFcn: {}
```

```
                    CLim: {}
                 CLimMode: {'auto'  'manual'}
             CameraPosition: {}
          CameraPositionMode: {'auto'  'manual'}
                CameraTarget: {}
            CameraTargetMode: {'auto'  'manual'}
              CameraUpVector: {}
           CameraUpVectorMode: {'auto'  'manual'}
              CameraViewAngle: {}
         CameraViewAngleMode: {'auto'  'manual'}
                  Children: {}
                  Clipping: {[on]  [off]}
            ClippingStyle: {'rectangle'  '3dbox'}
                    Color: {1×0 cell}
               ColorOrder: {}
            ColorOrderIndex: {}
                 ColorScale: {'linear'  'log'}
                   Colormap: {}
                ContextMenu: {}
                  CreateFcn: {}
             DataAspectRatio: {}
         DataAspectRatioMode: {'auto'  'manual'}
                  DeleteFcn: {}
                  FontAngle: {'normal'  'italic'}
                   FontName: {}
                   FontSize: {}
                FontSizeMode: {'auto'  'manual'}
              FontSmoothing: {[on]  [off]}
                  FontUnits: {1×5 cell}
                 FontWeight: {'normal'  'bold'}
                  GridAlpha: {}
              GridAlphaMode: {'auto'  'manual'}
                  GridColor: {1×0 cell}
              GridColorMode: {'auto'  'manual'}
              GridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
              GridLineWidth: {}
            GridLineWidthMode: {'auto'  'manual'}
            HandleVisibility: {'on'  'callback'  'off'}
                     HitTest: {[on]  [off]}
                InnerPosition: {}
           InteractionOptions: {}
                 Interactions: {}
                Interruptible: {[on]  [off]}
     LabelFontSizeMultiplier: {}
                      Layer: {'bottom'  'top'}
                     Layout: {}
      LineStyleCyclingMethod: {'aftercolor'  'beforecolor'  'withcolor'}
             LineStyleOrder: {}
        LineStyleOrderIndex: {}
                  LineWidth: {}
              MinorGridAlpha: {}
           MinorGridAlphaMode: {'auto'  'manual'}
               MinorGridColor: {1×0 cell}
           MinorGridColorMode: {'auto'  'manual'}
```

```
      MinorGridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
      MinorGridLineWidth: {}
   MinorGridLineWidthMode: {'auto'  'manual'}
               NextPlot: {1×4 cell}
          OuterPosition: {}
                 Parent: {}
           PickableParts: {'visible'  'none'  'all'}
      PlotBoxAspectRatio: {}
   PlotBoxAspectRatioMode: {'auto'  'manual'}
               Position: {}
      PositionConstraint: {'innerposition'  'outerposition'}
              Projection: {'orthographic'  'perspective'}
                Selected: {[on]  [off]}
      SelectionHighlight: {[on]  [off]}
              SortMethod: {'depth'  'childorder'}
                Subtitle: {}
      SubtitleFontWeight: {'normal'  'bold'}
                     Tag: {}
                 TickDir: {'in'  'out'  'both'  'none'}
             TickDirMode: {'auto'  'manual'}
    TickLabelInterpreter: {'none'  'tex'  'latex'}
              TickLength: {}
                   Title: {}
  TitleFontSizeMultiplier: {}
         TitleFontWeight: {'normal'  'bold'}
 TitleHorizontalAlignment: {'left'  'center'  'right'}
                 Toolbar: {}
                   Units: {1×6 cell}
                UserData: {}
                    View: {}
                 Visible: {[on]  [off]}
                    XAxis: {}
            XAxisLocation: {'bottom'  'top'  'origin'}
                  XColor: {1×0 cell}
             XColorMode: {'auto'  'manual'}
                   XDir: {'normal'  'reverse'}
                  XGrid: {[on]  [off]}
                 XLabel: {}
                   XLim: {}
                XLimMode: {'auto'  'manual'}
             XLimitMethod: {'tickaligned'  'tight'  'padded'}
               XMinorGrid: {[on]  [off]}
               XMinorTick: {[on]  [off]}
                   XScale: {'linear'  'log'}
                    XTick: {}
               XTickLabel: {}
          XTickLabelMode: {'auto'  'manual'}
      XTickLabelRotation: {}
   XTickLabelRotationMode: {'auto'  'manual'}
               XTickMode: {'auto'  'manual'}
           YAxisLocation: {'left'  'right'  'origin'}
                  YColor: {1×0 cell}
             YColorMode: {'auto'  'manual'}
                   YDir: {'normal'  'reverse'}
```

```
                  YGrid: {[on]  [off]}
                 YLabel: {}
                   YLim: {}
               YLimMode: {'auto'  'manual'}
           YLimitMethod: {'tickaligned'  'tight'  'padded'}
             YMinorGrid: {[on]  [off]}
             YMinorTick: {[on]  [off]}
                 YScale: {'linear'  'log'}
                  YTick: {}
              YTickLabel: {}
          YTickLabelMode: {'auto'  'manual'}
      YTickLabelRotation: {}
  YTickLabelRotationMode: {'auto'  'manual'}
               YTickMode: {'auto'  'manual'}
                   ZAxis: {}
                  ZColor: {1×0 cell}
              ZColorMode: {'auto'  'manual'}
                    ZDir: {'normal'  'reverse'}
                  ZGrid: {[on]  [off]}
                 ZLabel: {}
                   ZLim: {}
               ZLimMode: {'auto'  'manual'}
           ZLimitMethod: {'tickaligned'  'tight'  'padded'}
             ZMinorGrid: {[on]  [off]}
             ZMinorTick: {[on]  [off]}
                 ZScale: {'linear'  'log'}
                  ZTick: {}
              ZTickLabel: {}
          ZTickLabelMode: {'auto'  'manual'}
      ZTickLabelRotation: {}
  ZTickLabelRotationMode: {'auto'  'manual'}
               ZTickMode: {'auto'  'manual'}

                   ALim: {}
               ALimMode: {'auto'  'manual'}
             AlphaScale: {'linear'  'log'}
               Alphamap: {}
      AmbientLightColor: {1×0 cell}
                    Box: {[on]  [off]}
              BoxStyle: {'full'  'back'}
             BusyAction: {'queue'  'cancel'}
          ButtonDownFcn: {}
                   CLim: {}
               CLimMode: {'auto'  'manual'}
         CameraPosition: {}
     CameraPositionMode: {'auto'  'manual'}
          CameraTarget: {}
       CameraTargetMode: {'auto'  'manual'}
         CameraUpVector: {}
     CameraUpVectorMode: {'auto'  'manual'}
        CameraViewAngle: {}
    CameraViewAngleMode: {'auto'  'manual'}
               Children: {}
               Clipping: {[on]  [off]}
```

```
          ClippingStyle: {'rectangle'  '3dbox'}
                  Color: {1×0 cell}
             ColorOrder: {}
        ColorOrderIndex: {}
             ColorScale: {'linear'  'log'}
               Colormap: {}
            ContextMenu: {}
              CreateFcn: {}
        DataAspectRatio: {}
    DataAspectRatioMode: {'auto'  'manual'}
              DeleteFcn: {}
              FontAngle: {'normal'  'italic'}
               FontName: {}
               FontSize: {}
           FontSizeMode: {'auto'  'manual'}
         FontSmoothing: {[on]  [off]}
              FontUnits: {1×5 cell}
             FontWeight: {'normal'  'bold'}
              GridAlpha: {}
         GridAlphaMode: {'auto'  'manual'}
              GridColor: {1×0 cell}
         GridColorMode: {'auto'  'manual'}
         GridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
         GridLineWidth: {}
      GridLineWidthMode: {'auto'  'manual'}
       HandleVisibility: {'on'  'callback'  'off'}
                HitTest: {[on]  [off]}
          InnerPosition: {}
     InteractionOptions: {}
           Interactions: {}
          Interruptible: {[on]  [off]}
LabelFontSizeMultiplier: {}
                  Layer: {'bottom'  'top'}
                 Layout: {}
 LineStyleCyclingMethod: {'aftercolor'  'beforecolor'  'withcolor'}
         LineStyleOrder: {}
    LineStyleOrderIndex: {}
              LineWidth: {}
         MinorGridAlpha: {}
     MinorGridAlphaMode: {'auto'  'manual'}
         MinorGridColor: {1×0 cell}
     MinorGridColorMode: {'auto'  'manual'}
     MinorGridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
     MinorGridLineWidth: {}
 MinorGridLineWidthMode: {'auto'  'manual'}
               NextPlot: {1×4 cell}
          OuterPosition: {}
                 Parent: {}
          PickableParts: {'visible'  'none'  'all'}
     PlotBoxAspectRatio: {}
 PlotBoxAspectRatioMode: {'auto'  'manual'}
               Position: {}
     PositionConstraint: {'innerposition'  'outerposition'}
             Projection: {'orthographic'  'perspective'}
```

```
                Selected: {[on]  [off]}
      SelectionHighlight: {[on]  [off]}
              SortMethod: {'depth'  'childorder'}
                Subtitle: {}
      SubtitleFontWeight: {'normal'  'bold'}
                     Tag: {}
                 TickDir: {'in'  'out'  'both'  'none'}
             TickDirMode: {'auto'  'manual'}
    TickLabelInterpreter: {'none'  'tex'  'latex'}
              TickLength: {}
                   Title: {}
  TitleFontSizeMultiplier: {}
         TitleFontWeight: {'normal'  'bold'}
TitleHorizontalAlignment: {'left'  'center'  'right'}
                 Toolbar: {}
                   Units: {1×6 cell}
                UserData: {}
                    View: {}
                 Visible: {[on]  [off]}
                    XAxis: {}
           XAxisLocation: {'bottom'  'top'  'origin'}
                  XColor: {1×0 cell}
             XColorMode: {'auto'  'manual'}
                   XDir: {'normal'  'reverse'}
                  XGrid: {[on]  [off]}
                 XLabel: {}
                   XLim: {}
              XLimMode: {'auto'  'manual'}
            XLimitMethod: {'tickaligned'  'tight'  'padded'}
              XMinorGrid: {[on]  [off]}
              XMinorTick: {[on]  [off]}
                  XScale: {'linear'  'log'}
                   XTick: {}
              XTickLabel: {}
          XTickLabelMode: {'auto'  'manual'}
      XTickLabelRotation: {}
  XTickLabelRotationMode: {'auto'  'manual'}
             XTickMode: {'auto'  'manual'}
          YAxisLocation: {'left'  'right'  'origin'}
                  YColor: {1×0 cell}
             YColorMode: {'auto'  'manual'}
                   YDir: {'normal'  'reverse'}
                  YGrid: {[on]  [off]}
                 YLabel: {}
                   YLim: {}
              YLimMode: {'auto'  'manual'}
            YLimitMethod: {'tickaligned'  'tight'  'padded'}
              YMinorGrid: {[on]  [off]}
              YMinorTick: {[on]  [off]}
                  YScale: {'linear'  'log'}
                   YTick: {}
              YTickLabel: {}
          YTickLabelMode: {'auto'  'manual'}
      YTickLabelRotation: {}
```

```
YTickLabelRotationMode: {'auto'  'manual'}
           YTickMode: {'auto'  'manual'}
               ZAxis: {}
              ZColor: {1×0 cell}
           ZColorMode: {'auto'  'manual'}
                ZDir: {'normal'  'reverse'}
               ZGrid: {[on]  [off]}
              ZLabel: {}
                ZLim: {}
            ZLimMode: {'auto'  'manual'}
         ZLimitMethod: {'tickaligned'  'tight'  'padded'}
           ZMinorGrid: {[on]  [off]}
           ZMinorTick: {[on]  [off]}
               ZScale: {'linear'  'log'}
                ZTick: {}
           ZTickLabel: {}
       ZTickLabelMode: {'auto'  'manual'}
   ZTickLabelRotation: {}
ZTickLabelRotationMode: {'auto'  'manual'}
           ZTickMode: {'auto'  'manual'}

                ALim: {}
            ALimMode: {'auto'  'manual'}
           AlphaScale: {'linear'  'log'}
            Alphamap: {}
    AmbientLightColor: {1×0 cell}
                 Box: {[on]  [off]}
            BoxStyle: {'full'  'back'}
          BusyAction: {'queue'  'cancel'}
        ButtonDownFcn: {}
                CLim: {}
            CLimMode: {'auto'  'manual'}
       CameraPosition: {}
   CameraPositionMode: {'auto'  'manual'}
         CameraTarget: {}
     CameraTargetMode: {'auto'  'manual'}
       CameraUpVector: {}
   CameraUpVectorMode: {'auto'  'manual'}
      CameraViewAngle: {}
  CameraViewAngleMode: {'auto'  'manual'}
            Children: {}
            Clipping: {[on]  [off]}
       ClippingStyle: {'rectangle'  '3dbox'}
               Color: {1×0 cell}
          ColorOrder: {}
      ColorOrderIndex: {}
           ColorScale: {'linear'  'log'}
            Colormap: {}
         ContextMenu: {}
            CreateFcn: {}
      DataAspectRatio: {}
  DataAspectRatioMode: {'auto'  'manual'}
            DeleteFcn: {}
            FontAngle: {'normal'  'italic'}
```

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                FontSize: {}
            FontSizeMode: {'auto'  'manual'}
          FontSmoothing: {[on]  [off]}
              FontUnits: {1×5 cell}
             FontWeight: {'normal'  'bold'}
              GridAlpha: {}
          GridAlphaMode: {'auto'  'manual'}
              GridColor: {1×0 cell}
          GridColorMode: {'auto'  'manual'}
          GridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
          GridLineWidth: {}
       GridLineWidthMode: {'auto'  'manual'}
        HandleVisibility: {'on'  'callback'  'off'}
                 HitTest: {[on]  [off]}
           InnerPosition: {}
      InteractionOptions: {}
            Interactions: {}
           Interruptible: {[on]  [off]}
 LabelFontSizeMultiplier: {}
                   Layer: {'bottom'  'top'}
                  Layout: {}
  LineStyleCyclingMethod: {'aftercolor'  'beforecolor'  'withcolor'}
          LineStyleOrder: {}
     LineStyleOrderIndex: {}
               LineWidth: {}
          MinorGridAlpha: {}
      MinorGridAlphaMode: {'auto'  'manual'}
          MinorGridColor: {1×0 cell}
      MinorGridColorMode: {'auto'  'manual'}
      MinorGridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
      MinorGridLineWidth: {}
 MinorGridLineWidthMode: {'auto'  'manual'}
                NextPlot: {1×4 cell}
           OuterPosition: {}
                  Parent: {}
           PickableParts: {'visible'  'none'  'all'}
      PlotBoxAspectRatio: {}
  PlotBoxAspectRatioMode: {'auto'  'manual'}
                Position: {}
      PositionConstraint: {'innerposition'  'outerposition'}
              Projection: {'orthographic'  'perspective'}
                Selected: {[on]  [off]}
      SelectionHighlight: {[on]  [off]}
              SortMethod: {'depth'  'childorder'}
                Subtitle: {}
      SubtitleFontWeight: {'normal'  'bold'}
                     Tag: {}
                 TickDir: {'in'  'out'  'both'  'none'}
             TickDirMode: {'auto'  'manual'}
    TickLabelInterpreter: {'none'  'tex'  'latex'}
              TickLength: {}
                   Title: {}
 TitleFontSizeMultiplier: {}
```

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          TitleFontWeight: {'normal'  'bold'}
    TitleHorizontalAlignment: {'left'  'center'  'right'}
                     Toolbar: {}
                       Units: {1×6 cell}
                    UserData: {}
                        View: {}
                     Visible: {[on]  [off]}
                       XAxis: {}
              XAxisLocation: {'bottom'  'top'  'origin'}
                      XColor: {1×0 cell}
                 XColorMode: {'auto'  'manual'}
                       XDir: {'normal'  'reverse'}
                      XGrid: {[on]  [off]}
                     XLabel: {}
                       XLim: {}
                   XLimMode: {'auto'  'manual'}
                XLimitMethod: {'tickaligned'  'tight'  'padded'}
                  XMinorGrid: {[on]  [off]}
                  XMinorTick: {[on]  [off]}
                      XScale: {'linear'  'log'}
                       XTick: {}
                  XTickLabel: {}
             XTickLabelMode: {'auto'  'manual'}
         XTickLabelRotation: {}
      XTickLabelRotationMode: {'auto'  'manual'}
                  XTickMode: {'auto'  'manual'}
              YAxisLocation: {'left'  'right'  'origin'}
                      YColor: {1×0 cell}
                 YColorMode: {'auto'  'manual'}
                       YDir: {'normal'  'reverse'}
                      YGrid: {[on]  [off]}
                     YLabel: {}
                       YLim: {}
                   YLimMode: {'auto'  'manual'}
                YLimitMethod: {'tickaligned'  'tight'  'padded'}
                  YMinorGrid: {[on]  [off]}
                  YMinorTick: {[on]  [off]}
                      YScale: {'linear'  'log'}
                       YTick: {}
                  YTickLabel: {}
             YTickLabelMode: {'auto'  'manual'}
         YTickLabelRotation: {}
      YTickLabelRotationMode: {'auto'  'manual'}
                  YTickMode: {'auto'  'manual'}
                       ZAxis: {}
                      ZColor: {1×0 cell}
                 ZColorMode: {'auto'  'manual'}
                       ZDir: {'normal'  'reverse'}
                      ZGrid: {[on]  [off]}
                     ZLabel: {}
                       ZLim: {}
                   ZLimMode: {'auto'  'manual'}
                ZLimitMethod: {'tickaligned'  'tight'  'padded'}
                  ZMinorGrid: {[on]  [off]}
```

```
            ZMinorTick: {[on]  [off]}
                ZScale: {'linear'  'log'}
                 ZTick: {}
             ZTickLabel: {}
         ZTickLabelMode: {'auto'  'manual'}
     ZTickLabelRotation: {}
 ZTickLabelRotationMode: {'auto'  'manual'}
              ZTickMode: {'auto'  'manual'}

                  ALim: {}
              ALimMode: {'auto'  'manual'}
             AlphaScale: {'linear'  'log'}
               Alphamap: {}
      AmbientLightColor: {1×0 cell}
                    Box: {[on]  [off]}
              BoxStyle: {'full'  'back'}
            BusyAction: {'queue'  'cancel'}
         ButtonDownFcn: {}
                  CLim: {}
              CLimMode: {'auto'  'manual'}
         CameraPosition: {}
     CameraPositionMode: {'auto'  'manual'}
          CameraTarget: {}
       CameraTargetMode: {'auto'  'manual'}
         CameraUpVector: {}
     CameraUpVectorMode: {'auto'  'manual'}
        CameraViewAngle: {}
    CameraViewAngleMode: {'auto'  'manual'}
              Children: {}
              Clipping: {[on]  [off]}
         ClippingStyle: {'rectangle'  '3dbox'}
                 Color: {1×0 cell}
            ColorOrder: {}
        ColorOrderIndex: {}
             ColorScale: {'linear'  'log'}
               Colormap: {}
           ContextMenu: {}
             CreateFcn: {}
        DataAspectRatio: {}
    DataAspectRatioMode: {'auto'  'manual'}
              DeleteFcn: {}
              FontAngle: {'normal'  'italic'}
               FontName: {}
               FontSize: {}
           FontSizeMode: {'auto'  'manual'}
         FontSmoothing: {[on]  [off]}
              FontUnits: {1×5 cell}
             FontWeight: {'normal'  'bold'}
              GridAlpha: {}
         GridAlphaMode: {'auto'  'manual'}
              GridColor: {1×0 cell}
         GridColorMode: {'auto'  'manual'}
         GridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
         GridLineWidth: {}
```

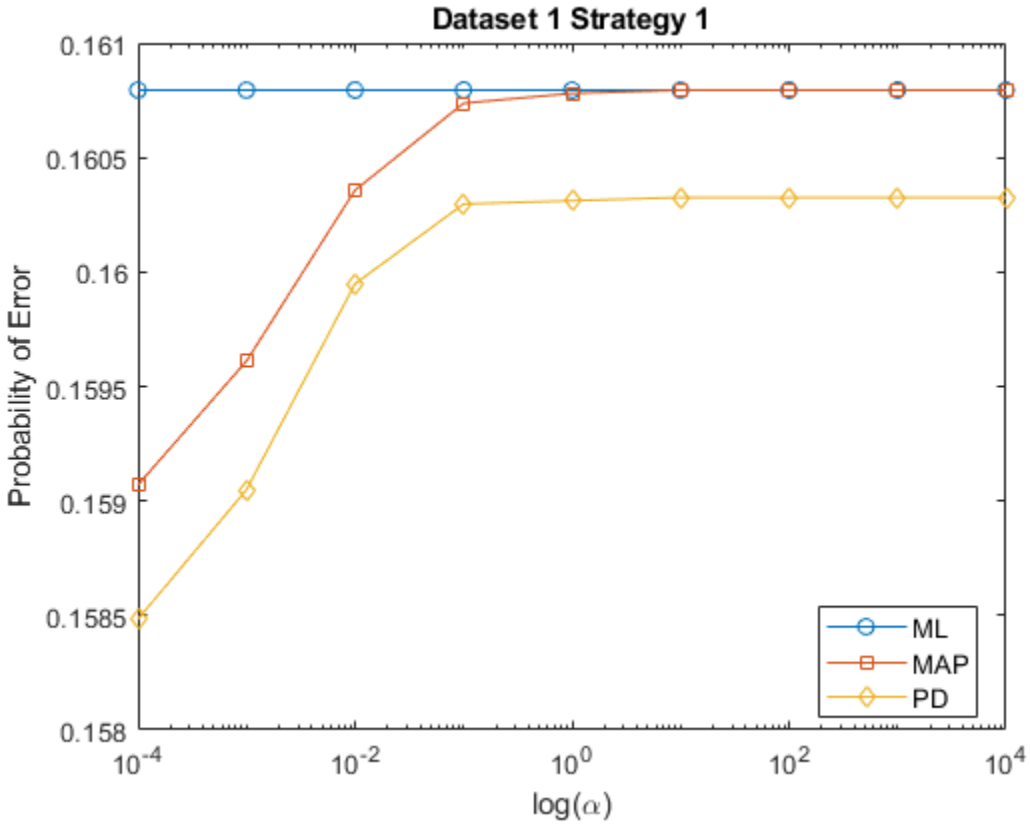
```
       GridLineWidthMode: {'auto'  'manual'}
        HandleVisibility: {'on'  'callback'  'off'}
                 HitTest: {[on]  [off]}
           InnerPosition: {}
      InteractionOptions: {}
            Interactions: {}
           Interruptible: {[on]  [off]}
  LabelFontSizeMultiplier: {}
                   Layer: {'bottom'  'top'}
                  Layout: {}
   LineStyleCyclingMethod: {'aftercolor'  'beforecolor'  'withcolor'}
          LineStyleOrder: {}
     LineStyleOrderIndex: {}
               LineWidth: {}
          MinorGridAlpha: {}
      MinorGridAlphaMode: {'auto'  'manual'}
          MinorGridColor: {1×0 cell}
      MinorGridColorMode: {'auto'  'manual'}
      MinorGridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
      MinorGridLineWidth: {}
   MinorGridLineWidthMode: {'auto'  'manual'}
                NextPlot: {1×4 cell}
           OuterPosition: {}
                  Parent: {}
           PickableParts: {'visible'  'none'  'all'}
       PlotBoxAspectRatio: {}
    PlotBoxAspectRatioMode: {'auto'  'manual'}
                Position: {}
      PositionConstraint: {'innerposition'  'outerposition'}
              Projection: {'orthographic'  'perspective'}
                Selected: {[on]  [off]}
      SelectionHighlight: {[on]  [off]}
              SortMethod: {'depth'  'childorder'}
                Subtitle: {}
      SubtitleFontWeight: {'normal'  'bold'}
                     Tag: {}
                 TickDir: {'in'  'out'  'both'  'none'}
             TickDirMode: {'auto'  'manual'}
    TickLabelInterpreter: {'none'  'tex'  'latex'}
              TickLength: {}
                   Title: {}
   TitleFontSizeMultiplier: {}
          TitleFontWeight: {'normal'  'bold'}
  TitleHorizontalAlignment: {'left'  'center'  'right'}
                 Toolbar: {}
                   Units: {1×6 cell}
                UserData: {}
                    View: {}
                 Visible: {[on]  [off]}
                   XAxis: {}
            XAxisLocation: {'bottom'  'top'  'origin'}
                  XColor: {1×0 cell}
             XColorMode: {'auto'  'manual'}
                   XDir: {'normal'  'reverse'}
```

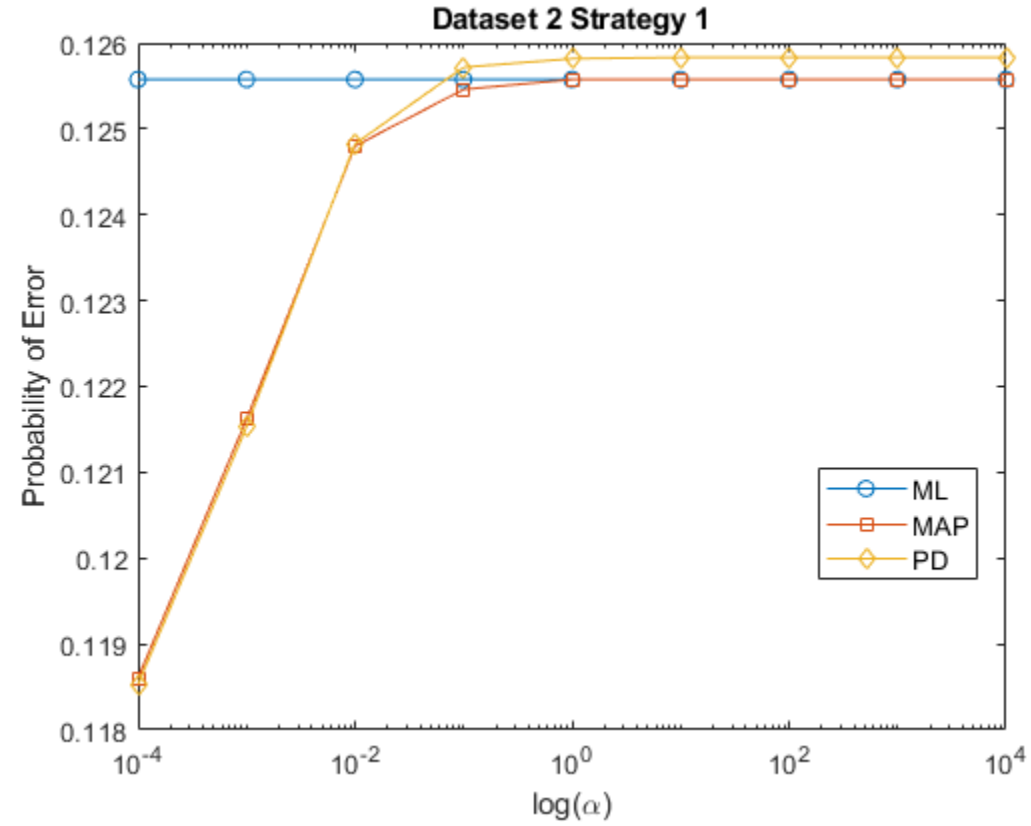
```
                  XGrid: {[on]  [off]}
                 XLabel: {}
                   XLim: {}
               XLimMode: {'auto'  'manual'}
            XLimitMethod: {'tickaligned'  'tight'  'padded'}
              XMinorGrid: {[on]  [off]}
              XMinorTick: {[on]  [off]}
                  XScale: {'linear'  'log'}
                  XTick: {}
              XTickLabel: {}
          XTickLabelMode: {'auto'  'manual'}
      XTickLabelRotation: {}
  XTickLabelRotationMode: {'auto'  'manual'}
               XTickMode: {'auto'  'manual'}
           YAxisLocation: {'left'  'right'  'origin'}
                  YColor: {1×0 cell}
              YColorMode: {'auto'  'manual'}
                    YDir: {'normal'  'reverse'}
                  YGrid: {[on]  [off]}
                 YLabel: {}
                   YLim: {}
               YLimMode: {'auto'  'manual'}
            YLimitMethod: {'tickaligned'  'tight'  'padded'}
              YMinorGrid: {[on]  [off]}
              YMinorTick: {[on]  [off]}
                  YScale: {'linear'  'log'}
                  YTick: {}
              YTickLabel: {}
          YTickLabelMode: {'auto'  'manual'}
      YTickLabelRotation: {}
  YTickLabelRotationMode: {'auto'  'manual'}
               YTickMode: {'auto'  'manual'}
                  ZAxis: {}
                 ZColor: {1×0 cell}
              ZColorMode: {'auto'  'manual'}
                    ZDir: {'normal'  'reverse'}
                  ZGrid: {[on]  [off]}
                 ZLabel: {}
                   ZLim: {}
               ZLimMode: {'auto'  'manual'}
            ZLimitMethod: {'tickaligned'  'tight'  'padded'}
              ZMinorGrid: {[on]  [off]}
              ZMinorTick: {[on]  [off]}
                  ZScale: {'linear'  'log'}
                  ZTick: {}
              ZTickLabel: {}
          ZTickLabelMode: {'auto'  'manual'}
      ZTickLabelRotation: {}
  ZTickLabelRotationMode: {'auto'  'manual'}
               ZTickMode: {'auto'  'manual'}

                   ALim: {}
               ALimMode: {'auto'  'manual'}
             AlphaScale: {'linear'  'log'}
```

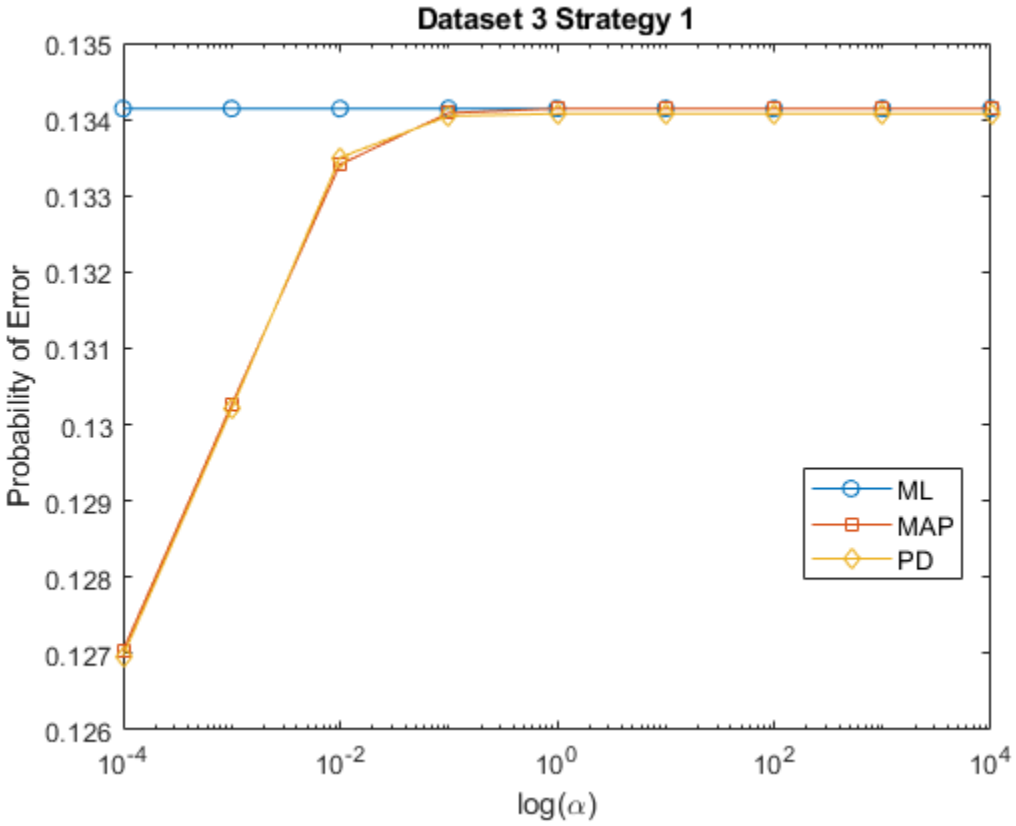
```
                Alphamap: {}
       AmbientLightColor: {1×0 cell}
                     Box: {[on]  [off]}
                BoxStyle: {'full'  'back'}
              BusyAction: {'queue'  'cancel'}
           ButtonDownFcn: {}
                    CLim: {}
                CLimMode: {'auto'  'manual'}
          CameraPosition: {}
        CameraPositionMode: {'auto'  'manual'}
            CameraTarget: {}
          CameraTargetMode: {'auto'  'manual'}
            CameraUpVector: {}
        CameraUpVectorMode: {'auto'  'manual'}
           CameraViewAngle: {}
       CameraViewAngleMode: {'auto'  'manual'}
                Children: {}
                Clipping: {[on]  [off]}
           ClippingStyle: {'rectangle'  '3dbox'}
                   Color: {1×0 cell}
              ColorOrder: {}
           ColorOrderIndex: {}
                ColorScale: {'linear'  'log'}
                  Colormap: {}
              ContextMenu: {}
                CreateFcn: {}
           DataAspectRatio: {}
       DataAspectRatioMode: {'auto'  'manual'}
                DeleteFcn: {}
                FontAngle: {'normal'  'italic'}
                 FontName: {}
                 FontSize: {}
             FontSizeMode: {'auto'  'manual'}
           FontSmoothing: {[on]  [off]}
                FontUnits: {1×5 cell}
               FontWeight: {'normal'  'bold'}
                GridAlpha: {}
           GridAlphaMode: {'auto'  'manual'}
                GridColor: {1×0 cell}
           GridColorMode: {'auto'  'manual'}
           GridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
           GridLineWidth: {}
         GridLineWidthMode: {'auto'  'manual'}
          HandleVisibility: {'on'  'callback'  'off'}
                   HitTest: {[on]  [off]}
             InnerPosition: {}
        InteractionOptions: {}
              Interactions: {}
           Interruptible: {[on]  [off]}
    LabelFontSizeMultiplier: {}
                    Layer: {'bottom'  'top'}
                   Layout: {}
     LineStyleCyclingMethod: {'aftercolor'  'beforecolor'  'withcolor'}
           LineStyleOrder: {}
```

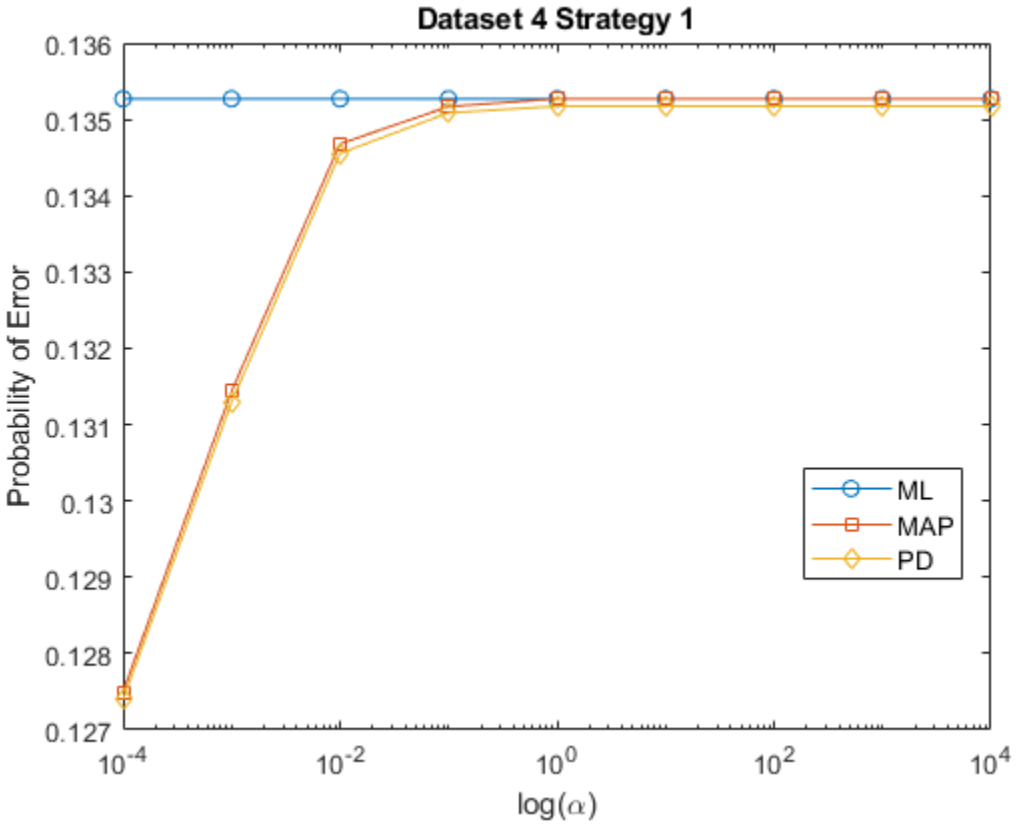
```
     LineStyleOrderIndex: {}
               LineWidth: {}
           MinorGridAlpha: {}
        MinorGridAlphaMode: {'auto'  'manual'}
           MinorGridColor: {1×0 cell}
        MinorGridColorMode: {'auto'  'manual'}
        MinorGridLineStyle: {'-'  '--'  ':'  '-.'  'none'}
        MinorGridLineWidth: {}
     MinorGridLineWidthMode: {'auto'  'manual'}
                  NextPlot: {1×4 cell}
             OuterPosition: {}
                    Parent: {}
              PickableParts: {'visible'  'none'  'all'}
          PlotBoxAspectRatio: {}
       PlotBoxAspectRatioMode: {'auto'  'manual'}
                  Position: {}
          PositionConstraint: {'innerposition'  'outerposition'}
                  Projection: {'orthographic'  'perspective'}
                    Selected: {[on]  [off]}
          SelectionHighlight: {[on]  [off]}
                  SortMethod: {'depth'  'childorder'}
                    Subtitle: {}
          SubtitleFontWeight: {'normal'  'bold'}
                         Tag: {}
                     TickDir: {'in'  'out'  'both'  'none'}
                TickDirMode: {'auto'  'manual'}
       TickLabelInterpreter: {'none'  'tex'  'latex'}
                  TickLength: {}
                       Title: {}
     TitleFontSizeMultiplier: {}
             TitleFontWeight: {'normal'  'bold'}
    TitleHorizontalAlignment: {'left'  'center'  'right'}
                    Toolbar: {}
                      Units: {1×6 cell}
                   UserData: {}
                       View: {}
                    Visible: {[on]  [off]}
                      XAxis: {}
              XAxisLocation: {'bottom'  'top'  'origin'}
                     XColor: {1×0 cell}
                XColorMode: {'auto'  'manual'}
                      XDir: {'normal'  'reverse'}
                     XGrid: {[on]  [off]}
                    XLabel: {}
                      XLim: {}
                   XLimMode: {'auto'  'manual'}
               XLimitMethod: {'tickaligned'  'tight'  'padded'}
                 XMinorGrid: {[on]  [off]}
                 XMinorTick: {[on]  [off]}
                     XScale: {'linear'  'log'}
                      XTick: {}
                 XTickLabel: {}
             XTickLabelMode: {'auto'  'manual'}
          XTickLabelRotation: {}
```

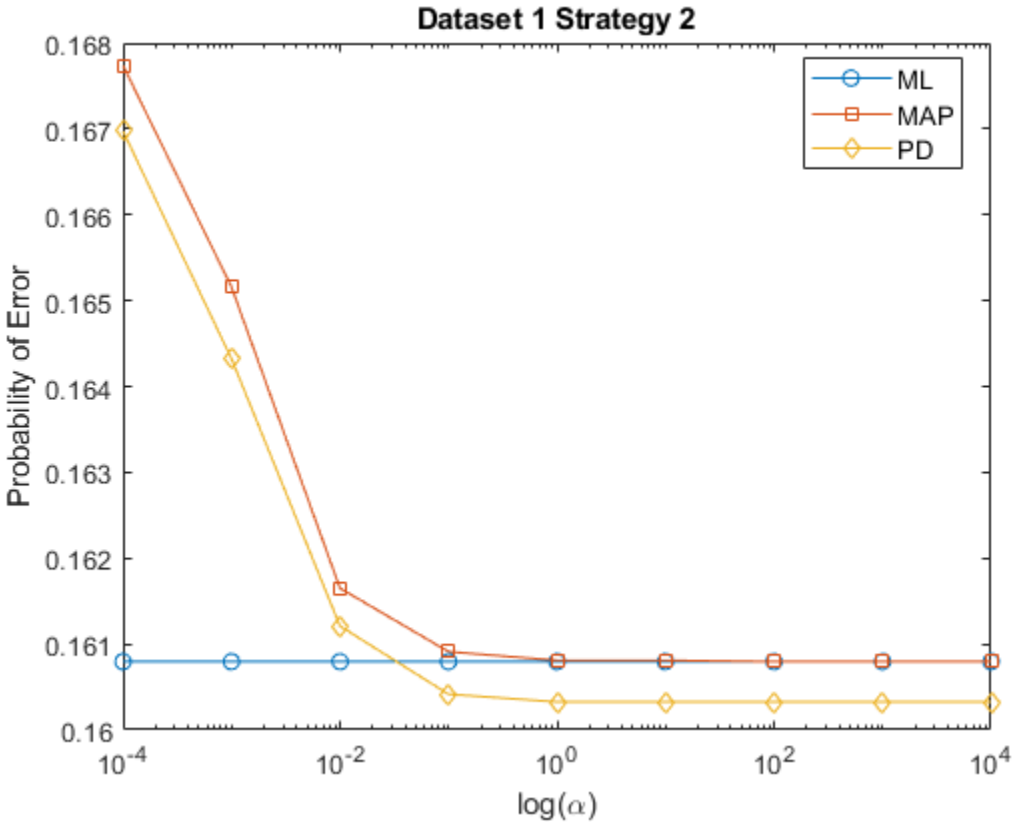
```
XTickLabelRotationMode: {'auto'  'manual'}
             XTickMode: {'auto'  'manual'}
         YAxisLocation: {'left'  'right'  'origin'}
                YColor: {1×0 cell}
            YColorMode: {'auto'  'manual'}
                  YDir: {'normal'  'reverse'}
                 YGrid: {[on]  [off]}
                YLabel: {}
                  YLim: {}
              YLimMode: {'auto'  'manual'}
           YLimitMethod: {'tickaligned'  'tight'  'padded'}
             YMinorGrid: {[on]  [off]}
             YMinorTick: {[on]  [off]}
                 YScale: {'linear'  'log'}
                  YTick: {}
             YTickLabel: {}
         YTickLabelMode: {'auto'  'manual'}
     YTickLabelRotation: {}
YTickLabelRotationMode: {'auto'  'manual'}
             YTickMode: {'auto'  'manual'}
                 ZAxis: {}
                ZColor: {1×0 cell}
            ZColorMode: {'auto'  'manual'}
                  ZDir: {'normal'  'reverse'}
                 ZGrid: {[on]  [off]}
                ZLabel: {}
                  ZLim: {}
              ZLimMode: {'auto'  'manual'}
           ZLimitMethod: {'tickaligned'  'tight'  'padded'}
             ZMinorGrid: {[on]  [off]}
             ZMinorTick: {[on]  [off]}
                 ZScale: {'linear'  'log'}
                  ZTick: {}
             ZTickLabel: {}
         ZTickLabelMode: {'auto'  'manual'}
     ZTickLabelRotation: {}
ZTickLabelRotationMode: {'auto'  'manual'}
             ZTickMode: {'auto'  'manual'}
```

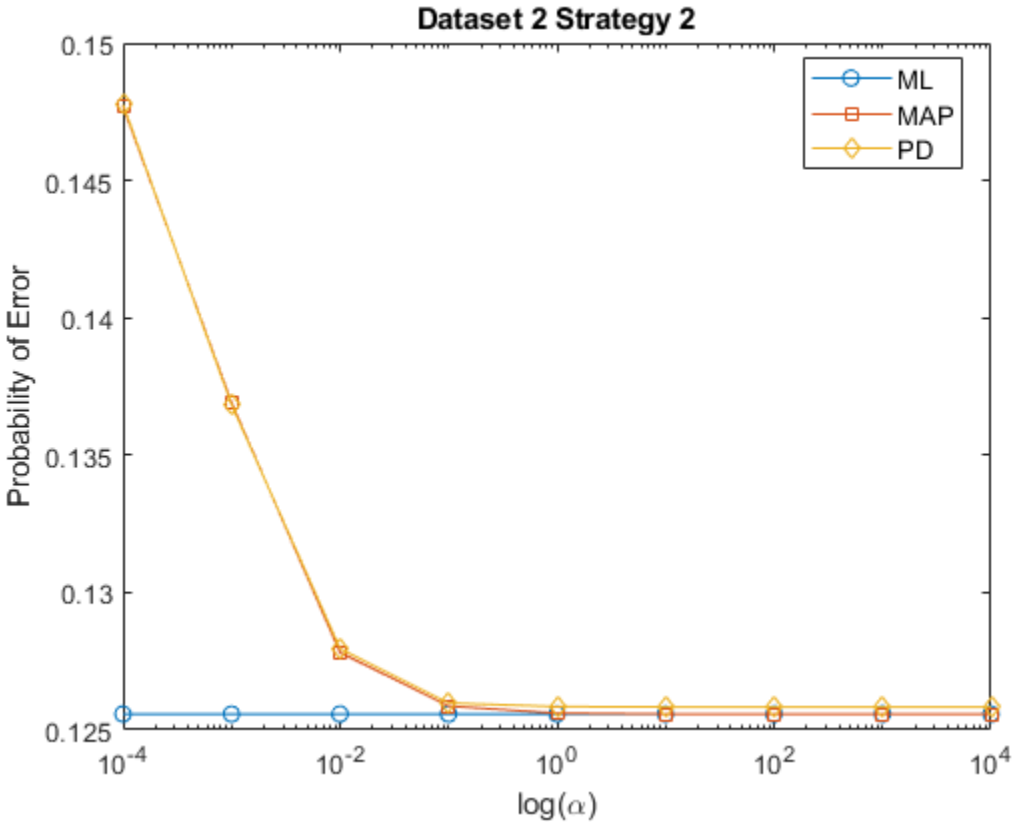

Dataset 1 Strategy 1
Probability of Error
0.161
0.1605
0.16
0.1595
0.159
0.1585
0.158
10^{-4}
10^{-2}
10^{0}
10^{2}
10^{4}
log(α)
ML
MAP
PD

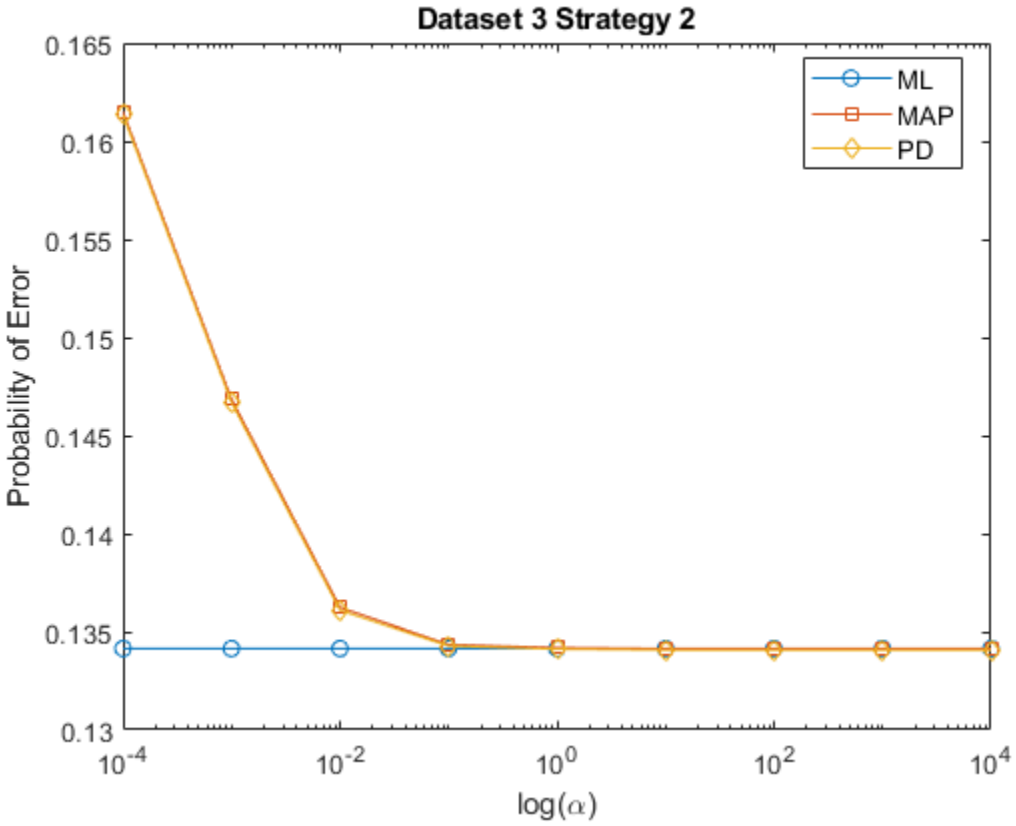

Dataset 2 Strategy 1
Probability of Error
0.126
0.125
0.124
0.123
0.122
0.121
0.12
0.119
0.118
10^{-4}
10^{-2}
10^{0}
10^{2}
10^{4}
log(α)
ML
MAP
PD

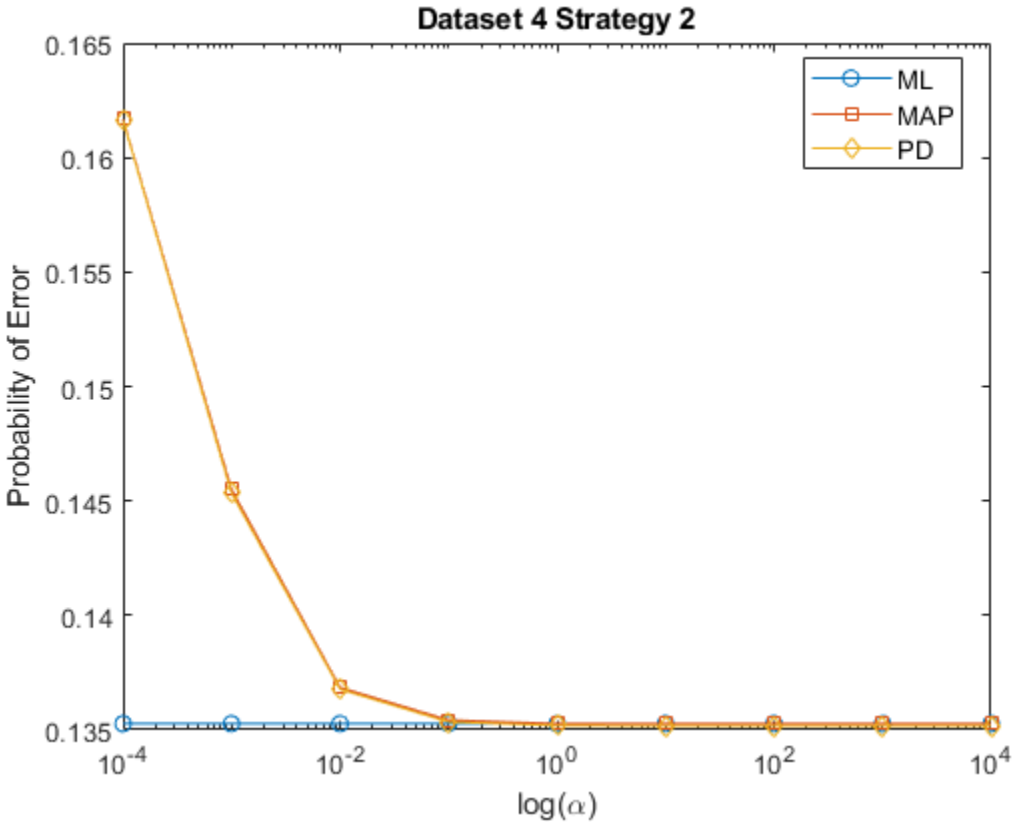

Dataset 3 Strategy 1
Probability of Error
0.135
0.134
0.133
0.132
0.131
0.13
0.129
0.128
0.127
0.126
10^{-4}
10^{-2}
10^{0}
10^{2}
10^{4}
log(α)
ML
MAP
PD


Dataset 4 Strategy 1
Probability of Error
0.136
0.135
0.134
0.133
0.132
0.131
0.13
0.129
0.128
0.127
10^{-4}
10^{-2}
10^{0}
10^{2}
10^{4}
log(α)
ML
MAP
PD


Dataset 1 Strategy 2
ML
MAP
PD
Probability of Error
0.168
0.167
0.166
0.165
0.164
0.163
0.162
0.161
0.16
10^{-4}
10^{-2}
10^{0}
10^{2}
10^{4}
log(α)


Dataset 2 Strategy 2
ML
MAP
PD
Probability of Error
0.15
0.145
0.14
0.135
0.13
0.125
10^{-4}
10^{-2}
10^{0}
10^{2}
10^{4}
log(α)


Dataset 3 Strategy 2
ML
MAP
PD
Probability of Error
0.165
0.16
0.155
0.15
0.145
0.14
0.135
0.13
10^{-4}
10^{-2}
10^{0}
10^{2}
10^{4}
log(α)


Dataset 4 Strategy 2
ML
MAP
PD
Probability of Error
0.165
0.16
0.155
0.15
0.145
0.14
0.135
10^{-4}
10^{-2}
10^{0}
10^{2}
10^{4}
log(α)

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