

MISAEEL MORALES - MATH 7993 NUMERICAL OPTIMIZATION - PROJECT
OPTIMIZATION OF MULTIVARIATE GAUSSIAN MIXTURE MODEL

Real Mu1: [-2.00, 3.00]

Real Mu2: [4.00, -5.00]

Real Sigma1: [15.00 0.00 ; 1.00 5.00]

Real Sigma2: [12.00 1.00 ; 1.00 10.00]

Real Proportions: [0.700, 0.300]

Initial Guess Mu1: [-4.00, -2.00]

Initial Guess Mu2: [5.00, -3.00]

Initial Guess Sigma1: [50.00 0.10 ; 5.00 50.00]

Initial Guess Sigma2: [30.00 1.00 ; 0.10 3.00]

Initial Guess Proportions: [0.900, 0.100]

EM-estimated Mu1: [-0.9973, 1.1744]

EM-estimated Mu2: [6.1176, -5.6970]

EM-estimated Sigma1: [19.923 -5.520 ; -5.520 17.560]

EM-estimated Sigma2: [7.982 0.667 ; 0.667 6.577]

EM-estimated Proportions: [0.8990, 0.1010]. Sum: 1.0000

Stopping Criteria: max iterations (5) | tolerance (1.0e-06)

Maximum number of iterations (5) was reached before convergence!

Optimization Toolbox subroutine:

Exiting: Maximum number of iterations has been exceeded

- increase MaxIter option.

Current function value: 5678.693935

NMS Optimization-estimated Mu1: [-1.7732, 2.6373]

NMS Optimization-estimated Mu2: [-1.7732, 2.6373]

NMS Optimization-estimated Sigma1: [22.574 -10.137 ; -4.129 6.977]

NMS Optimization-estimated Sigma2: [15.032 0.520 ; 0.439 8.701]

NMS Optimization-estimated Proportions: [0.7505, 0.2495]. Sum: 1.000

Local minimum possible.

fminunc stopped because it cannot decrease the objective function
along the current search direction.

<stopping criteria details>

QN Optimization-estimated Mu1: [-2.1415, 2.9300]

QN Optimization-estimated Mu2: [4.0771, -5.2477]

QN Optimization-estimated Sigma1: [16.126 -5.520 ; 2.551 5.425]

QN Optimization-estimated Sigma2: [11.966 0.667 ; 1.201 10.764]

QN Optimization-estimated Proportions: [0.7005, 0.2995]. Sum: 1.000

EM-estimated Negative Log-Likelihood: 5793.9083

fminsearch Negative Log-Likelihood: 5678.6939

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fminunc Negative Log-Likelihood: 5632.4469  
Original Parameters Negative Log-Likelihood: 5638.7686  
Elapsed time is 12.369103 seconds.  
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