



# An Improved EM algorithm

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(Submitted on 3 May 2013)

In this paper, we firstly give a brief introduction of expectation maximization (EM) algorithm, and then discuss the initial value sensitivity of expectation maximization algorithm. Subsequently, we give a short proof of EM's convergence. Then, we implement experiments with the expectation maximization algorithm (We implement all the experiments on Gaussian mixture model (GMM)). Our experiment with expectation maximization is performed in the following three cases: initialize randomly; initialize with result of K-means; initialize with result of K-medoids. The experiment result shows that expectation maximization algorithm depend on its initial state or parameters. And we found that EM initialized with K-medoids performed better than both the one initialized with K-means and the one initialized randomly.

Subjects: **Learning (cs.LG)**; Artificial Intelligence (cs.AI); Machine Learning (stat.ML)

Cite as: **arXiv:1305.0626 [cs.LG]**  
(or **arXiv:1305.0626v1 [cs.LG]** for this version)

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