Pseudocode Example

Basic usage

initialize parameters θ randomly
while not converged
  for each data point x_i
    compute posterior $Q(z_i) = P(z_i \mid x_i, \theta)$
  end
end
return θ

With a title

EM Algorithm

initialize parameters θ randomly
while not converged
  // E-step: compute expected log-likelihood
  for each data point x_i
    compute posterior probabilities $Q(z_i) = P(z_i \mid x_i, \theta)$
  end
  // M-step: maximize expected log-likelihood
  for each parameter θ_j
    update θ_j by maximizing $\sum_i Q(z_i) \log P(x_i, z_i \mid \theta)$
  end
  compute new log-likelihood $\log P(X \mid \theta)$
  if $|\log P(X \mid \theta_{\text{new}}) - \log P(X \mid \theta_{\text{old}})| < \varepsilon$ **then**
    mark as converged
  else
    set $\theta_{\text{old}} \leftarrow \theta_{\text{new}}$
  end
end
return θ

With line numbers and booktabs styling

Bubble Sort

for $i = 1$ **to** $n - 1$
  for $j = 1$ **to** $n - i$
    if $A[j] > A[j + 1]$ **then**
      swap $A[j]$ and $A[j + 1]$
    end
  end
end

Cross-referenceable figure (filter-managed)

Algorithm 1 gives the EM algorithm.

EM Algorithm

initialize parameters θ randomly
while not converged
  // E-step
  for each data point x_i
    compute $Q(z_i) = P(z_i \mid x_i, \theta)$
  end
  // M-step
  for each parameter θ_j
    update θ_j to maximize $\sum_i Q(z_i) \log P(x_i, z_i \mid \theta)$
  end
end
return θ

Algorithm 1: The EM algorithm.