

1134-60-410

Ryan D. Coatney* (rcoatney@math.arizona.edu) and **Marek Rychlik**
(rychlik@email.arizona.edu). *On the Convergence of Various Clustering Algorithms.*

Clustering algorithms are an important part of modern data analysis. The K-means and EM clustering algorithm both use an iterative process to find hidden variables in a mixture distribution. In connection with these algorithms, we look at a random family of nonlinear mappings obtained via the joint distribution of a sample of size N from a mixture of K distributions. We look at the dynamics of this family and give a proof of convergence. We also use Birkhoff's method of applying the Hilbert metric to get bounds on convergence. We compare the answers obtained to those found by maximizing using Lagrange multipliers. (Received September 12, 2017)