# Arabic Character Recognition Using Regression Curves with the Expectation Maximization Algorithm

**Authors :** Abdullah A. AlShaher

**Abstract :** In this paper, we demonstrate how regression curves can be used to recognize 2D non-rigid handwritten shapes. Each shape is represented by a set of non-overlapping uniformly distributed landmarks. The underlying models utilize 2$^{nd}$ order of polynomials to model shapes within a training set. To estimate the regression models, we need to extract the required coefficients which describe the variations for a set of shape class. Hence, a least square method is used to estimate such modes. We then proceed by training these coefficients using the apparatus Expectation Maximization algorithm. Recognition is carried out by finding the least error landmarks displacement with respect to the model curves. Handwritten isolated Arabic characters are used to evaluate our approach.