Abstract—A novel hybrid wavelet-based fractal feature extraction method is proposed for the detection of microcalcification clusters (MCCs) in digital mammograms. The hybrid features consists of a set of the surrounding region dependence based features [11] and the newly proposed wavelet-based fractal features. A new fractal feature extraction scheme is given in this paper, which is based on the wavelet coefficients of a mammography image. Experiments demonstrated that the proposed hybrid features have the best convergence ability of artificial neural networks (ANNs) classifier compared to other two sets of features tested in the experiments. A good ratio of true positive fraction to false positive fraction (ROC curve) has been achieved. The proposed MCCs detection system provides an adequate framework for microcalcification detection in mammograms.