Title: Software fault prediction using BP-based crisp artificial neural networks

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Abstract: Early fault detection for software reduces the cost of developments. Fault level can be predicted through learning mechanisms. Conventionally, precise metrics measure the fault level and crisp artificial neural networks (CANNs) perform the learning. However, the performance of CANNs depends on complexities of data and learning algorithm. This paper considers these two complexities to predict the fault level of software. We apply the principle component analysis (PCA) to reduce the dimensionality of data, and employ the correlation-based feature selection (CFS) to select the best features. CANNs, then, predict the fault level of software using back propagation (BP) algorithm as a learning mechanism. To investigate the performance of BP-based CANNs, we analyse varieties of dimensionality reduction. The results reveal the superiority of PCA to CFS in terms of accuracy.