**ABSTRACT**

Healthcare industry encompasses abundant data, which is increasing everyday. Conversely, tools for analyzing these records are incredibly less. Machine learning provides a lot of techniques for solving diagnostic problems in a variety of medical domains. Intelligent systems are able to learn from machine learning methods, when they are provided with a set of clinical cases as training set. This paper aims at a comparative study of widely used supervised classification algorithms – Naïve Bayes, Multi Layer Perceptrons, Logistic Model Trees, and Nearest Neighbor with Generalized Exemplars applied to predictive diabetes dataset. The machine learning algorithms used in this study are chosen for their representability and diversity. They are evaluated on the basis of their accuracy, learning time and error rates.