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Author Chao-Yung Wang
Author's Email Address No Public.
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Abstract
One of the most frequent reasons for instituting mechanical ventilation is to decrease patient's work of breathing. Ventilator weaning is the process of discontinuing mechanical ventilation from patients with respiratory failure. Previous investigations reported that about 40% of ICU patients need mechanical ventilator for sustaining their lives. Although mechanical ventilators are important for the patients with respiratory failure, ventilator support should be withdrawn when no longer necessary to reduce the possible nosocomial complications and costs. If it is possible to build a prediction model with objective measurements and predictors of weaning extracted from historical cases, the model will help decrease the dependence on the wisdom and skill of an individual physician. The built model is also able to help train the new hands on ventilator weaning.
In this study, 191 weaning trial cases with support of mechanical ventilation between 7 days and 14 days were collected from the ICU of a regional hospital in Southern Taiwan. We built prediction modules for successful ventilator weaning with C4.5, Naive Bayes classifier, and logistic regression model. Twenty-five variables in total were recorded, and we built the prediction models based on 10, 17, and 25 variables according to historical data and the clinical experience of a senior physician. The empirical experiment results show that the Naive Bayes classifier based on 17 variables achieves the best performance.
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