

A review unveiling various machine learning algorithms adopted for biohydrogen productions from microalgae

ABSTRACT

Biohydrogen production from microalgae is a potential alternative energy source that is now intensively being researched. The complex natures of the biological processes involved have afflicted the accuracy of traditional modelling and optimization, besides being costly. Accordingly, machine learning algorithms have been employed to overcome setbacks, as these approaches have the capability to predict nonlinear interactions and handle multivariate data from microalgal biohydrogen studies. Thus, the review focuses on revealing the recent applications of machine learning techniques in microalgal biohydrogen production. The working principles of random forests, artificial neural networks, support vector machines, and regression algorithms are covered. The applications of these techniques are analyzed and compared for their effectiveness, advantages and disadvantages in the relationship studies, classification of results, and prediction of microalgal hydrogen production. These techniques have shown great performance despite limited data sets that are complex and nonlinear. However, the current techniques are still susceptible to overfitting, which could potentially reduce prediction performance. These could be potentially resolved or mitigated by comparing the methods, should the input data be limited.