

The geomechanical properties of rock, including shear strength (SS) and uniaxial compressive strength (UCS), are very important parameters in designing rock structures. To improve the accuracy of SS and UCS prediction, this study presented an evolving support vector regression (SVR) using Grey Wolf optimization (GWO). To examine the feasibility and applicability of the SVR-GWO model, the differential evolution (DE) and artificial bee colony (ABC) algorithms were also used. In other words, the SVR hyperparameters were tuned using the GWO, DE, and ABC algorithms. To implement the proposed models, a comprehensive database accessible in an open-source was used in this study. Finally, the comparative experiments such as root mean square error (RMSE) were conducted to show the superiority of the proposed models. The SVR-GWO model predicted the SS and UCS with RMSE of 0.460 and 3.208, respectively, while, the SVR-DE model predicted the SS and UCS with RMSE of 0.542 and 5.4, respectively. Furthermore, the SVR-ABC model predicted the SS and UCS with RMSE of 0.855 and 5.033, respectively. The aforementioned results clearly exhibited the applicability as well as the usability of the proposed SVR-GWO model in the prediction of both SS and UCS parameters. Accordingly, the SVR-GWO model can be also applied to solving various complex systems, especially in geotechnical and mining fields