ABSTRACT

Computed tomography (CT) scan is one popular non-invasive mean of lung cancer early diagnosis. Computer vision can aid radiologists to interpret the result of lung scanning to increase diagnosis accuracy as there are inherent heterogenity and pattern complexity of CT scan images. However, an appropriate hyperparameter configuration is required to achive optimal performance of deep learning-based computer vision models. This final project offers a solution of optimizing hyperparameters of a EfficientNetV2B0 model using various metaheuristic algorithm, such as Rao-1, Rao-2, Rao-3 and Slime Mold (SMA) Algorithms. The dataset LIDC-IDRI was used in the experiment for training, testing, and validation. Several scenarios was made to figure out the effects of different choices of algorithm and population size to the optimization process and the resulting model. By choosing population size n=10, the objective value converged slower than population size n=20 that exhibits drastic convergence in early generations and became plateau in later generations. With z=0.03 for SMA, the objective value change is unstable thus didn't converge to optimum value. On the final result, the best performance was achieved by Rao-3 algorithm with population size of 10, with accuracy, precision, recall, and f1-score of 0.9602, 0.9489, 0.9139, and 0.9290 respectively.

Keywords: *Metaheuristic Algorithm, EfficientNetV2, Lung Cancer, Hyperparameter Optimization*