

E. Conclusion

As we have seen the result of how we implement CNN with lighter layer optimized by genetic algorithm to enhance the performance based on the validation metrics **TABLE IV** and **Fig. 5**. The results show genetic algorithm can compete gradient descent optimizer. The test of overall performance from **TABLE IV** where CNN-ADAM-GA has higher score where **85.1%** for F-score and **86.8%** for the AUC score compared to other models.

We consider **CNN-ADAM-GA** is recommended to use to perform classification even though it consumes more time compared to model that does not use genetic algorithm but it outperforms and surpassed the performance far higher than conventional models based on the **TABLE IV**. For future work we can try a deeper layer along with more hyperparameter tuning on the genetic algorithm.

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