Paper title: Monkeypox Virus Detection Using Pre-trained Deep Learning-based-Approaches
Paper link: https://link.springer.com/article/10.1007/s10916-022-01868-2

1 Summary:

1.1 Motivation:

The purpose of this paper is to explore the potential of AI-based detection to identify Monkeypox virus at an early stage. The authors tried to compare 13 different pre-trained deep learning (DL) models to identify the best performing DL model for the detection of Monkeypox disease or similar tasks. The authors hypothesize that pre-trained deep learning models can be fine-tuned to achieve optimal accuracy in detecting Monkeypox virus.

1.2 Contribution:

The authors propose a common custom layer approach for fine-tuning 13 pre-trained deep learning models and an ensemble approach to exploit the highest decision for the optimal end classification result. The proposed approaches show promising results, with an average accuracy of 87.13%.

1.3 Methodology:

The authors used a publicly available dataset related to Monkeypox detection and fine-tuned 13 pre-trained deep learning models using the proposed common custom layers. They also used an ensemble approach to combine the predictions of multiple models. The performance of the proposed approaches was evaluated using precision, recall, F1-score, and accuracy.

1.4 Conclusion:

The experiments show that the proposed approaches can significantly improve the performance of pre-trained deep learning models in detecting Monkeypox virus. The ensemble approach outperforms the state-of-the-art methods with an average accuracy of 87.13%.

2 Limitations:

2.1 First Limitation/Critique:

The dataset size used in this study is comparatively smaller, which could limit the generalizability of the proposed approaches. The addition of more data could improve the performance further.

2.2 Second Limitation/Critique:

The proposed AI approach is based on pre-trained deep learning models, which could be a problem if deployed in a memory-constrained setting. The design of novel lightweight deep learning models could be an interesting work to let it work on a limited resource.

3 Synthesis:

The proposed approaches in this paper have potential applications in early detection of Monkeypox virus, which could help in preventing outbreaks and controlling the spread of the virus. The study also highlights the importance of developing novel lightweight deep learning models for memory-constrained settings. Future research could focus on expanding the dataset size and exploring the potential of the proposed approaches in detecting other viruses.