

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Deep Learning-Based Facial Image Analysis in Medical Research: A Systematic Review Protocol
<b>AUTHORS</b>	Su, Zhaohui; Liang, Bin; Shi, Feng; Gelfond, J; Šegalo, Sabina; Wang, Jing; Jia, Peng; Hao, Xiaoning

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Ran Wei Chinese Academy of Medical Sciences and Peking Union Medical College
<b>REVIEW RETURNED</b>	28-Jan-2021

<b>GENERAL COMMENTS</b>	<p>This manuscript demonstrates a systematic review that could provide a timely understanding of the characteristics, challenges, as well as opportunities in deep learning-based facial image analysis applied in the contexts of disease detection, diagnosis. The idea of reviewing deep-learning-based facial analysis technology aimed at medical usage is interesting. But there is still some improvement that could be made.</p> <ol style="list-style-type: none"><li>1. A list that demonstrates what deep learning technology has been applied for facial analysis would be better. The author mentioned CNN would be one option for facial analysis. But there are other technologies, such as LSTM, GAN, and Encoder-Decoder, also have the capability for facial image analysis.</li><li>2. A detailed statement of the capability of deep-learning-based facial analysis would be preferred. Is it possible to use deep-learning-based facial analysis for early screening or diagnosis for tumors, diabetes, or other diseases?</li></ol>
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<b>REVIEWER</b>	Christiana Kartsonaki University of Oxford
<b>REVIEW RETURNED</b>	06-May-2021

<b>GENERAL COMMENTS</b>	<p>Deep Learning-Based Facial Image Analysis in Medical Research: A Systematic Review Protocol</p> <p>This is a good protocol for an interesting study. Some comments:</p> <ol style="list-style-type: none"><li>1. The introduction could be made more concise to avoid some of the generic machine learning/deep learning content. One definition of what deep learning is would suffice.</li><li>2. P. 7 should 'micks' be 'mimics'?</li><li>3. P. 8 what does 'statistical variances' mean? I suggest to reword this.</li><li>4. The data analysis section should provide more details on how the collected data will be analysed.</li></ol>
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## VERSION 1 – AUTHOR RESPONSE

<b>Responses to Reviewer 1's Comments</b>	
<p>Comments to the Author:</p> <p>This manuscript demonstrates a systematic review that could provide a timely understanding of the characteristics, challenges, as well as opportunities in deep learning-based facial image analysis applied in the contexts of disease detection, diagnosis. The idea of reviewing deep-learning-based facial analysis technology aimed at medical usage is interesting. But there is still some improvement that could be made.</p>	<p>Thank you very much for your constructive input. We addressed all your comments thoroughly, and we hope the revised manuscript meets your expectations.</p>
<p>1. A list that demonstrates what deep learning technology has been applied for facial analysis would be better. The author mentioned CNN would be one option for facial analysis. But there are other technologies, such as LSTM, GAN, and Encoder-Decoder, also have the capability for facial image analysis.</p> <p>2. A detailed statement of the capability of deep-learning-based facial analysis word be preferred. Is it possible to use deep-learning-based facial analysis for early screening or diagnosis for tumors, diabetes, or other diseases?</p>	<p>1. Thank you very much for your kind suggestion. We developed a table (i.e., Table 1) to address your concerns.</p> <p>2. Thank you very much for your comments. A table that sheds light on the capability of deep-learning-based facial analysis could be found in Table 1.</p>
<b>Responses to Reviewer 2's Comments</b>	
<p>Comments to the Author:</p> <p>Deep Learning-Based Facial Image Analysis in Medical Research: A Systematic Review Protocol This is a good protocol for an interesting study.</p>	<p>Thank you very much for your constructive feedback and insightful comments. They mean a great deal to us. We revised the manuscript based on your suggestions, and we hope the revisions meet your expectations.</p>
<p>Some comments:</p> <p>1. The introduction could be made more concise to avoid some of the generic machine learning/deep learning content. One definition of what deep learning is would suffice.</p> <p>2. P. 7 should 'micks' be 'mimics'?</p> <p>3. P. 8 what does 'statistical variances' mean? I suggest to reword this.</p> <p>4. The data analysis section should provide</p>	<p>Thank you very much for your comments. We addressed your concerns thoroughly:</p> <ol style="list-style-type: none"> <li>1. We revised the introduction section per your suggestion.</li> <li>2. You're correct, and we deleted this section as it offers redundant information on deep learning (to address your first</li> </ol>

more details on how the collected data will be analysed.	<p>concern).</p> <ol style="list-style-type: none"> <li>3. Thank you very much for your kind advice. We changed it into “statistical differences” based on your advice.</li> <li>4. We revised the data analysis section accordingly.</li> </ol>
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**VERSION 2 – REVIEW**

<b>REVIEWER</b>	Christiana Kartsonaki University of Oxford
<b>REVIEW RETURNED</b>	15-Aug-2021

<b>GENERAL COMMENTS</b>	The authors have addressed previous comments.
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