**Scientific Review Form**

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| **Paper number:** | 99362 |
| **Paper title:** | Self-Aware LSTM-Based Agents |
| **Target journal (if any):** | N/A |

1. The form below is intended to provide a structure for evaluating the article in terms of its scientific merit, and to minimise or eliminate the major reasons for rejection through journal peer review. We have constructed the form to enable review of the article according to general IMRaD structure. Any additional comments outside of this form that the editor considers important should be added to the Additional Comments box at the end of this form.

2. If any of the sections is not relevant to your review, please indicate in the relevant box following each question.

|  | SECTIONAL QUESTION | COMMENTS AND RECOMMENDATIONS | ACTION NEEDED BY AUTHOR BEFORE JOURNAL (RE)SUBMISSION |
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| TITLE & KEYWORDS | Are the title and keywords appropriate to the content, and to the target journal (if provided)?  Does the title indicate the type of study or trial, where appropriate? | Yes, the title clearly and concisely expresses the content of the paper. An additional comment regarding the use of the abbreviation in the title can be found in the manuscript.  Keywords are not present and should be added prior to submission if required by the target publication. | Please add keywords if appropriate. |
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| ABSTRACT | Does the abstract adequately describe the paper, its main findings, and conclusions? | No abstract is present. | Please add an abstract if required by the target publication. |
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| INTRODUCTION | Does the Introduction satisfactorily define the hypothesis/outline the aims of the study? | It appeared from the manuscript that the Introduction section has yet to be written. However, a separate “Goal: A Simple Form of Self-Awareness” section is present that satisfactorily defines the aims of the study.  It should be noted here at the start of this review that the non-standard layout of the manuscript in its present form makes it difficult to answer these questions in the normal manner, because the manuscript lacks most of the sections typically expected for a journal submission and many of the 15 sections that are present each contain a mixture of background information and theory along with some minimal results and discussion. Detailed comments regarding this issue can be found at the end of this review and in the manuscript itself. | No further action required (excluding the missing Introduction section). |
| Does the Introduction satisfactorily explain the importance of the hypothesis being tested or the goals of the research? | Again, the manuscript contains no Introduction section, but the “Goal: A Simple Form of Self-Awareness” section satisfactorily explains the main goals of the research (albeit in a rather broad way – some background information will presumably be provided in the Introduction section). | No further action required (excluding the missing Introduction section). |
| Does the study adequately convey the context of what is already known about the problem/hypothesis, and identify the gap in knowledge addressed by the present work? | Again, the manuscript contains no Introduction section, but the “Goal: A Simple Form of Self-Awareness” section briefly contrasts the present work with two previous studies (albeit in a somewhat minimal way – some background information will presumably be provided in the Introduction section). Some additional background information regarding neural networks, encoding, LSTM networks, etc., is provided throughout the manuscript – indeed, it appears to constitute the majority of the manuscript as commented on elsewhere. | No further action required (excluding the missing Introduction section). |
| Do the authors adequately express their rationale for the choice of experiment or study design? | Yes, notwithstanding the non-standard layout, it seemed that the rationale behind the study design should be clear to readers in the field. | No further action required (excluding the missing Introduction section). |
| Do the authors adequately express the scientific advantages of their approach? For this question, please also consider whether or not the authors have provided adequate information to enable readers not familiar with the specific field to understand the hypothesis or the research question. | Yes, notwithstanding the non-standard layout, it seemed that the advantages of the reported approach should be clear to both general and advanced readers from the information given. | No further action required (excluding the missing Introduction section). |
| Does the Introduction summarize recent advances in the field, and cite relevant literature? | As per the above responses, previous work is discussed throughout the manuscript. Some references to previous work are present, although these did seem rather sparse for a manuscript of this length with something of a reliance on blog posts etc. rather than peer-reviewed literature. | Please ensure that recent advances in the field are summarized with appropriate citations. |
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| METHODS | Are the study design and methods appropriate to the research objectives? | As with many of the questions in this review, this is rather difficult to answer given the non-standard layout – the finer details of the study design appear to be distributed across multiple sections starting approximately with “Bidirectional LSTMs and Sequence-to-Sequence Models”, where they are interspersed with a large amount of background information and some limited results/discussion. The study design and methods seemed reasonable, but the layout made this difficult to assess. | No further action required. |
| Is sufficient information provided on procedures, replications, and controls (as appropriate)? | Again, this was difficult to assess given the non-standard layout. The individual procedures etc. are mostly described in sufficient detail across multiple sections, but the layout made this rather confusing to follow. As per the comments in the manuscript, it seemed that more details should be provided about the data sets used, ideally in a single section rather than two different sections (“Data Sets for Training and Testing” and “Data Sets”). | Please ensure that all procedures etc. are described in sufficient detail. |
| Is sufficient information provided on materials used and subjects? | Please see the above response. | Please ensure that all procedures etc. are described in sufficient detail. |
| CLINICAL SCIENCES/MEDICINE PAPERS: Is sufficient detail provided on interventions and outcome measures? | N/A | No further action required. |
| Is sufficient detail provided on analysis and statistical methods? Is any further statistical analysis required? | Few details are provided about any analysis methods. The “Data Sets” section does hint at an accuracy exceeding 98% being obtained and the “Web Demo” section highlights the operation of the developed agents, but sufficient information seemed to be lacking. | Please ensure that all analysis methods are described in sufficient detail. |
| Is sufficient information included to enable another researcher to judge the experiment and repeat the experiment itself? | For the most part, yes, but please see the above responses. | No further action required. |
| Are any additional experiments required? | No. | No further action required. |
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| RESULTS | Are the results clearly explained, without unwarranted interpretation? | In this editor’s opinion, no. Even after reading the entire manuscript, it was difficult to clearly identify what the “results” were, especially without an abstract, Introduction, or well-defined sections. Several of the later sections hint at specific findings (e.g., an accuracy exceeding 98% for a certain data set, which seems to be a major result but is mentioned only in passing) and the “Web Demo” section apparently demonstrates the operation of the agents, but the manuscript as a whole seemed to contain much more background information than it did results and discussion. As noted in the manuscript, a coherent “story” seems to be lacking at present, at least in the context of a typical research article. | Please ensure that the main results are clearly highlighted and explained. |
| Has the author made appropriate use of tables and/or graphs to demonstrate their findings? Have error bars been used appropriately for quantitative data? | No. Again, few actual “results” appear to be discussed, and the successful operation of the agents is likely not amenable to being demonstrated by tables/graphs in any case. The graphical elements present primarily relate to the schematic depictions of several networks, many of which appeared to be taken from a previous blog post or studies as background information. | No further action required. |
| Is there any duplication of data or findings in the text and figures/tables? | N/A | No further action required. |
| Have the authors adequately highlighted their findings in response to the study questions/hypothesis tested? | Please see the first response in this section. | Please ensure that the main results are clearly highlighted and explained. |
| Have the authors adequately reported any significant negative results? | N/A | No further action required. |
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| DISCUSSION | Have the authors adequately expressed what is novel and either different or not different to what was previously known about the hypothesis? | Please see the first response in the previous section. Again, it was often difficult to differentiate between the background information presented in each section and the novelties of the present work, but the later sections do provide some information about the operation of the developed agents and their self-awareness. It may be desirable to contrast these results with those of previous studies, which appears to be lacking at present. | Please consider explaining how the results compare with previous studies. |
| Have the authors adequately described how their findings move knowledge in the field forward or advance the understanding of the research topic? | Please see the above response. | Please consider explaining how the obtained findings advance the understanding of the topic. |
| Are there any negative results or limitations that are addressed, or should be addressed, in the paper? (*Note that this could be relevant to the Conclusions also.*) | No, none noted during editing. | No further action required. |
| Are there any unsupported claims, or instances where findings have been interpreted and data not shown? | No, none noted during editing. | No further action required. |
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| CONCLUSIONS | Have the authors adequately summarized the major conclusions, based on synthesis of the results and the Introduction and Discussion? | Yes, the “Summary and Conclusions” section provides a good and concise overview of the content of the manuscript, notwithstanding the previous comments regarding the lack of clarity about the obtained results. | No further action required. |
| Have the authors adequately summarized the importance of their work, based factually on their results? | Please see the above response. | No further action required. |
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| REFERENCES & CITATIONS | Are the citations and references relevant to the study? | As noted above and in the manuscript, the level of citation appeared somewhat minimal and there seemed to be an overreliance on blog posts and similar sources rather than peer-reviewed literature. It may be desirable to address this prior to submission. | Please consider whether more peer-reviewed literature could be cited. |
| Are there any important studies that have not been cited? | Please see the above response. | Please consider whether more peer-reviewed literature could be cited. |
| Are any citations missing, or any statements made that don't carry appropriate citation? | Some issues with missing citations and the citation format were noted during editing, which have been commented on throughout the manuscript. | Please address the comments regarding citations in the manuscript. |
| Is the level of self-citation appropriate, given the context of the study and the article length? | No signs of excessive self-citation were noted during editing. | No further action required. |
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| REPORTING & ETHICAL GUIDELINES | LIFE SCIENCES/MEDICINE PAPERS: Is the article compliant with the appropriate ethical standards and considerations, esp. relating to human or animal subjects? | N/A | No further action required. |
| Are conflicts of interest provided? | No. | Please add a conflicts of interest statement if appropriate. |
| Is the article compliant with any relevant reporting guidelines (e.g. CONSORT) for trials? | N/A | No further action required. |
| Have the authors provided funding information (particularly for open access mandate requirements)? | No. | Please add funding information if appropriate. |
| Are there any obvious indications as to plagiarized or un-cited content? | No, none noted during editing. | No further action required. |
| If the author has flagged up any sentences or sections about which they are concerned could have been inadvertently plagiarized, are there particular recommendations you can provide for how these should be handled? | N/A | No further action required. |
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| JOURNAL SELECTION | In your view, is the target journal selected by the authors appropriate? If not, please provide rationale and suggest alternative(s). | N/A (no target journal had been indicated) | No further action required. |
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| ADDITIONAL COMMENTS | If relevant, please provide any additional comments or recommendations to the authors not covered by the responses above. | From a language and technical perspective, there was very little to complain about with this manuscript, despite the author claiming to be a “hobbyist” – the text was very well written and all of the key concepts were clearly and concisely explained to the reader. As such, most of the changes made during editing were minor.  However, in this editor’s opinion, the main problem with the manuscript in its current form is a lack of overall structure or a continuous “story” for the reader to follow. This might be acceptable for certain contexts, e.g., if the goal is to prepare a “how-to guide” or tutorial-type essay, but if the intention is to submit it as a research article in an academic journal, it would be advisable to consider following the standard format with clearly defined sections (e.g., “Introduction”, “Methods”, “Results and Discussion”). Many of the 15 main sections of the manuscript appeared to contain a mixture of background information and details of the present work, such that it was often difficult to discern what novel methods/findings were being reported. Much of the middle part of the manuscript seemed to read almost as a review article, containing a lot of information that would more typically be found in an Introduction section (if included at all, rather than simply referring the reader to previous work), and there did not seem to be sufficient focus on clearly explaining the actual results and their implications. It is suggested to consider clarifying this prior to submission. |  |