From: irena.bojanova@computer.org
Subject: Major Revision Decision Re: TCCSI-2014-12-0666
Date: July 15, 2015 at 00:08
To: yan.yan@siat.ac.cn, yanyan.cas@gmail.com
Cc: tcc@computer.org

RE: TCCSI-2014-12-0666, "Classification of Massive Electrocardiogram Signals with Autoencoder-Based Deep Neural Network"
Manuscript Type: SI-Cloud Service for Health Care

Dear Mrs. Yan,

We have completed the review process of the above referenced paper for the IEEE Transactions on Cloud Computing and recommend that your paper undergo a Major Revision.

Enclosed are your reviews. If you should choose to revise your paper, please prepare a separate document describing how each of the reviewers' comments are responded to in your revision and submit through ScholarOne Manuscripts by 06-Oct-2015.

To revise your manuscript, log into https://mc.manuscriptcentral.com/tcc-cs and enter your Author Center, where you will find your manuscript title listed under "Manuscripts with Decisions." Under "Actions," click on "Create a Revision." Your manuscript number has been appended to denote a revision.

Once the revised manuscript is prepared, you can upload it and submit it through your Author Center.

The revised manuscript must contain the following:

-abstract
-index terms
-affiliation information
-main text
-references
-figure captions
-table titles
-brief biographies of each author

If you have appendices or supplemenary material, it must be submitted as a separate document.

When submitting your revised manuscript, you will be able to respond to the comments made by the reviewer(s) in the space provided. You can use this space to document any changes you make to the original manuscript. In order to expedite the processing of the revised manuscript, please be as specific as possible in your response to the reviewer(s)' questions and comments. You may also upload your responses as separate files for review along with your revision. If you choose to do this, please choose “Summary of Changes” as the file designation. You may not designate the changes in the text by using colored, bold, or italic text.

IMPORTANT: Your original files are available to you when you upload your revised manuscript. Please delete any redundant files before completing the submission.

When the submission process is complete, you will receive an automated confirmation email immediately. If you did not receive that email, your submission is not yet complete.

The Administrator will contact you should we have any concerns or questions regarding your revision. Otherwise, your revision will be forwarded to the assigned Associate Editor with a request to begin the second round of reviews.

Please be mindful when making your revisions that you still need to maintain the size limitations for papers submitted to IEEE Transactions on Cloud Computing. Our manuscript types and submission length guidelines (including the main text, the abstract, index terms, illustrations and references) are as follows:

IEEE Transactions on Cloud Computing manuscript types and submission length guidelines are found at,

http://www.computer.org/portal/web/peerreviewjournals/author#manuscript

Please note that double column will translate more readily into the final publication format. Our peer review double column templates can be found at,

http://www.computer.org/portal/web/peerreviewjournals/author#templates

Please do not hesitate in contacting me should you have any questions about our process or are experiencing technical difficulties. Thank you for your contribution to IEEE Transactions on Cloud Computing, and we look forward to receiving your revised manuscript.

Sincerely,

Irena Bojanova, EIC
Transactions on Cloud Computing
irena.bojanova@computer.org

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Associate Editor

Associate Editor
Comments to the Author:
(There are no comments. Please check to see if comments were included as a file attachment with this e-mail or as an attachment in your Author Center.)

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Reviewer Comments

Reviewer: 1

Recommendation: Author Should Prepare A Major Revision

Comments:
The author should explain how the proposed method based on deep learning and cloud computing combine to handle the large unlabelled ambulatory electrocardiography problem. Then, illustrate the design and the implement, add some relevant studies on cloud computing and analyze the results consequently.

Additional Questions:
1. Which category describes this manuscript?: Technology

2. How relevant is this manuscript to the readers? Explain under Public Comments.: Interesting - but not very relevant

1. Please explain how this manuscript advances the field of research and/or contributes something new to the literature.: The author presents a big data unsupervised learning approach of sparse autoencoder based deep neural network in large unlabelled ambulatory electrocardiography dataset to learn features automatically.

2. Is the manuscript technically sound? Please explain your answer under Public Comments below.: Yes

1. Are the title, abstract, and keywords appropriate? Please explain under Public Comments below.: Yes

2. Does the manuscript contain sufficient and appropriate references? Please explain under Public Comments below.: References are sufficient and appropriate

3. Does the introduction state the objectives of the manuscript in terms that encourage the reader to read on? Please explain under Public Comments below.: Yes

4. How would you rate the organization of the manuscript? (Is it focused? Is the length appropriate for the topic?) Please explain under Public Comments below.: Satisfactory

5. Please rate the readability of the manuscript. Please explain under Public Comments below.: Easy to read

6. Should the supplemental material be included? (Click on the Supplementary Files icon to view files): No, it should not be included at all

7. If yes to 6, should it be accepted:

Please rate the manuscript. Explain your choice: Good

Reviewer: 2

Recommendation: Revise and Resubmit "New"

Comments:
The paper proposes to use autoencoder-based deep neural networks to classify massive electrocardiogram signals. The authors conduct experiments on rela-world labeled data, and give rich results with respect to the number of network layers.

For the technical part, it is a simple applicaiton of an existing method, I don't see any contribution in this part, all functions go after standard formulations.

In experiments, although authors reported the accuracy, it is not clear whether the results are better than existing mehtods. It is not clear the benchmarks are the best ones for comparisons, as the papaer lacks a survey of related methods. Plus, how many parameters used in the model, I didn't see the testing on parameters and it is hard to explain why and when the proposed methods work better than others.

In part IV, the authors compare under 2-layers, 3-layers and 4-layers of the networks. When using 2-layers, the accuracy is 99.33%, and it drops to 99.07% under 3-layers, and then raises to 99.34% when 4-layers. The results seems unstable, why increasing the layer of networks will cause an accuray drop ? Why it is not always increasing of accuracy by adding layers? how did you set the parameters in the experiments? The paper needs more discussions on this point.

The paper lacks a careful check of writing. There are many typos and grammar errors. I just list a few as below:
abstract: The system perform -> performs
Section II, As Table I illustrated -> Table I illustrates
da tabase ->database
Section III, had been widely -> has been widely
Fig2 -> Fig. 2
The definition of \lambda ... -> defintions
Fig. 2: figure 2 illustrated -> illustrates

Additional Questions:
1. Which category describes this manuscript?: Practice / Application / Case Study / Experience Report

2. How relevant is this manuscript to the readers? Explain under Public Comments.: Relevant

1. Please explain how this manuscript advances the field of research and/or contributes something new to the literature.: The paper proposes to use autoencoder-based deep neural networks to classify massive electrocardiogram signals.

2. Is the manuscript technically sound? Please explain your answer under Public Comments below.: Appears to be - but didn't check completely

1. Are the title, abstract, and keywords appropriate? Please explain under Public Comments below.: Yes

2. Does the manuscript contain sufficient and appropriate references? Please explain under Public Comments below.: References are sufficient and appropriate

3. Does the introduction state the objectives of the manuscript in terms that encourage the reader to read on? Please explain under Public Comments below.: Could be improved

4. How would you rate the organization of the manuscript? (Is it focused? Is the length appropriate for the topic?) Please explain under Public Comments below.: Could be improved

5. Please rate the readability of the manuscript. Please explain under Public Comments below.: Readable - but requires some effort to understand

6. Should the supplemental material be included? (Click on the Supplementary Files icon to view files): No, it should not be included at all

7. If yes to 6, should it be accepted: After revisions. Please include explanation under Public Comments below.

Please rate the manuscript. Explain your choice: Fair

Reviewer: 3

Recommendation: Reject

Comments:
This paper presents a method to classify electrocardiogram signals which employs the autoencoder-based deep neural network. The paper has various issues as stated below.

1. The motivation of developing such classification is not well articulated. The proposed method is an ad hoc combination of several components such as autoencoder based algorithm, deep neural network structure, sparsity constraint, etc. It is not well justified why this combination is chosen. Is there other combination that works better? This needs to be justified.

2. What is the novelty and what are the major contributions of the paper, just a stack of several existing methods?

3. Technical details are lacking or missing in the presentation of the proposed method. For example, on page 3 (right column, second paragraph), it is stated that “In the adapted algorithm, we impose a sparsity constraint on the hidden units to guarantee the representation expression ability”. How can this be achieved?

4. It is mentioned on page 5 (left column) that the cost function J(\theta) is strictly convex. This needs to be justified (not just stated).

5. The paper is poorly written and presented. There are too many grammatical errors and types. This has significantly affected the reviewer’s understanding of the proposed method, for example,
Abstract: “The system perform … and consumed …..”, “The result shows that with ….. can get …..”, “ …. Collected from the subjects in the division of cardiology of the hospital” (which hospital?), and so on.

6. The number and type of samples used in the simulation are mentioned in the Conclusion section. It should be mentioned in Section V.

7. Different formats are used for references, e.g., see [19] and [20].

8. The notations are currently shown in the appendix. It is better to show them at the end of Section I.

Additional Questions:
1. Which category describes this manuscript?: Practice / Application / Case Study / Experience Report

2. How relevant is this manuscript to the readers? Explain under Public Comments.: Relevant

1. Please explain how this manuscript advances the field of research and/or contributes something new to the literature.: The proposed method in the manuscript is a combination of several existing techniques. The contributions are insufficient.

2. Is the manuscript technically sound? Please explain your answer under Public Comments below.: No

1. Are the title, abstract, and keywords appropriate? Please explain under Public Comments below.: Yes

2. Does the manuscript contain sufficient and appropriate references? Please explain under Public Comments below.: References are sufficient and appropriate

3. Does the introduction state the objectives of the manuscript in terms that encourage the reader to read on? Please explain under Public Comments below.: No

4. How would you rate the organization of the manuscript? (Is it focused? Is the length appropriate for the topic?) Please explain under Public Comments below.: Poor

5. Please rate the readability of the manuscript. Please explain under Public Comments below.: Difficult to read and understand

6. Should the supplemental material be included? (Click on the Supplementary Files icon to view files): Does not apply, no supplementary files included

7. If yes to 6, should it be accepted:

Please rate the manuscript. Explain your choice: Poor