Response to the Editor-in-Chief and to the Reviewer

The original letter from the Editor-in-Chief

Editorial Decision Letter on ESWA-D-20-02505

Ms. Ref. No.: ESWA-D-20-02505

Title: Quadratic Programming Feature Selection for Multicorrelated Signal Decoding with Partial Least Squares

Expert Systems With Applications

Dear Mr. Roman V Isachenko,

As Editor-in-Chief, I'm writing this editorial decision letter on your paper submission ESWA-D-20-02505. Please read through this entire editorial decision letter carefully and take all actions seriously in order to avoid any delay in the review process of your revised manuscript submission. You need to upload a 'Detailed Response to Reviewers' in the EM system with the following sections while submitting the revised manuscript. Please note that the Required Sections (Section #1 - a & b, Section #2 - a & b) with specific Compliance Requirements (stated in this editorial decision letter) must be clearly labeled and included in the 'Detailed Response to Reviewers.' The Required Sections must be clearly placed before the revised manuscript. Section #1-(a) MUST contain the complete text covered in this email letter from Editor-in-Chief. Please note that we will NOT admit any revised manuscript submission for further review if any of the Required Sections (i.e., Section #1 – a

& b, Section #2 – a & b) is incomplete or any non-compliance of the ESWA authors' guidelines in the PDF file of the revised manuscript that you approve in EM system. So you need to take the Required Sections and Compliance Requirements seriously to avoid any delay in the review process of your revised manuscript. The Required Sections must be placed in the order listed:

REQUIRED SECTIONS:

Section #1: a) and b)

a.   The entire editorial decision letter (i.e., complete text covered in this email letter) from Editor-in-Chief, and

b.   your Point-to-Point responses to Editor-in-Chief in terms of Required Sections and Compliance Requirements.

Responses to the Editor-in-Chief. The entire editorial decision letter and Point-to-Point responses are included in this document.

Section #2: a) and b)

a. The entire comments made by the Reviewer, and

b. your Point-to-Point responses to the Reviewer.

Responses to the Editor-in-Chief. The entire comments made by the Reviewer, and the authors' Point-to-Point responses to the Reviewer are included.

You may also highlight the changes in your revised manuscript.

Responses to the Editor-in-Chief. The changes are highlighted in red.

COMPLIANCE REQUIREMENTS:

In addition, please note that prior to admitting the revised submission to the next rigorous review process, all paper submissions must completely comply with ESWA Guide for Authors (see details at https://www.elsevier.com/journals/expert-systems-with-applications/0957-4174/guide-for-authors). These include at least the following Compliance Requirements:

A) Authorship policies - Please also note that ESWA takes authorship very seriously and all paper submissions MUST completely comply with all of the following three policies on authorship (clearly stated in the questionnaire responses in EM system) prior to a rigorous peer review process:

A)-1: The corresponding author needs to enter the full names, full affiliation with country and email address of every contributing author in EM online system. It is also mandatory that every contributing coauthor must be listed in EM at submission.

Response to the Editor-in-Chief. The full names, full affiliation with country and email address of every contributing author are included in EM.

A)-2: It is mandatory that the full names, full affiliation with country and email address of every contributing author must be included in title (authorship) page of the manuscript. The first page of the manuscript should contain the title of the paper, and the full name, full affiliation with country and email address of every contributing author. The second page of the manuscript should begin with the paper abstract. Note that cover letter is not title (authorship) page.

Response to the Editor-in-Chief. The full names, full affiliation with country and email address of every contributing author are included in the title page.

A)-3: The authorship information in EM system must be consistent with the authorship information on the title (authorship) page of the manuscript.

Response to the Editor-in-Chief. The authorship information of two pages is consistent.

B) Guidelines of reference style and reference list – Citations in the text should follow the referencing style used by the American Psychological Association (APA).

Response to the Editor-in-Chief. The references are made according to the APA style.

B)-1: Reference Style:

Citations in the text should follow the referencing style used by the American Psychological Association. You are referred to the Publication Manual of the American Psychological Association, Sixth Edition, ISBN 978-1-4338-0561-5. APA's in-text citations require the author's last name and the year of publication. You should cite publications in the text, for example, (Smith, 2020). However, you should not use [Smith, 2020]. Note: There should be no [1], [2], [3], etc in your manuscript.

Response to the Editor-in-Chief. Done.

B)-2: Reference List:

References should be arranged first alphabetically by the surname of the first author followed by initials of the author's given name, and then further sorted chronologically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters 'a', 'b', 'c', etc., placed after the year of publication. For example, Van der Geer, J., Hanraads, J. A. J., & Lupton, R. A. (2010). The art of writing a scientific article. Journal of Scientific Communications, 163, 51–59. https://doi.org/10.1016/j.Sc.2010.00372. Note: There should be no [1], [2], [3], etc in your references list.

Response to the Editor-in-Chief. Done.

C) Highlights guidelines – There should be a maximum of 85 characters, including spaces, per Highlight. Please kindly read this guideline carefully - the guideline does NOT say there should be a maximum of 85 words per Highlight. It says there should be a maximum of 85 characters per Highlight. As examples, the word "impact" consists of 6 characters; the word "significance" consists of 12 characters. Only include 3 to 5 Highlights. Minimum number is 3, and maximum number is 5.

Response to the Editor-in-Chief. Done.

NOTE: Your paper submission will be returned to authors and will NOT be admitted to further review if the revised paper fails to completely comply with the ESWA Guide for Authors. You need to take these ESWA Guide seriously to avoid any delay in the review process of your revised manuscript.

Response to the Editor-in-Chief. Thank you for the firm guidelines!

Response to the Reviewer

Responses to the Reviewer

Reviewer #2: The authors propose an optimization application supported by theory, with illustrative validation on feature selection in the context of classification. An important medical application is considered. Comments to improve it:

Response to the Reviewer. The authors highly appreciated the reviewer's comments, accepted them all with gratitude and improved the paper.

1. Please edit the paper carefully such that to respect the instructions for authors. A homogeneous style is desired.

Response to the Reviewer. The paper was edited. The author's guide was fulfilled. The paper style was homogenized. The improvements were highlighted by red.

2. You should present the contributions with respect to your past papers that should be cited. Your past algorithms are very well appreciated.

Response to the Reviewer. The references to the past papers were inserted at the introduction.

3. Besides, the authors should include the following recent optimization algorithms as they proved to be successful in various applications: Use of multi-parametric quadratic programming in fuzzy control systems (APH 2006), An APN model for Arrhythmic beat classification (Bioinform. 2014), HARD: Bit-split string matching using a heuristic algorithm to reduce memory demand (ROMJIST 2020), Optimal tuning of interval type-2 fuzzy controllers for nonlinear servo systems using slime mould algorithm (IJSS 2021).

Response to the Reviewer. Thank you for the good ideas. All these algorithms were carefully studied, the references were inserted in the list of references. The papers were cited in the introduction section.

4. I had a problem on understanding how the optimization algorithms work exactly from the provided description.

Response to the Reviewer. We had used CVXPY open-source library for solving the optimization problems. We added a comment about it to the paper (section 4, page 13).

5. Please pay attention to the definitions of the optimization problems. For example, which are the variables in (1)?

Response to the Reviewer. The problem (eq. 1) optimizes the variable z. The variable z is a relaxed vector of the feature importances. The original task is a discrete feature selection problem (eq. 4). The detailed explanation of the objective is presented at section 2. The necessary comment was put near the problem formulation (eq. 1).

6. Please better highlight the optimization problem used in feature selection.

Response to the Reviewer. The feature selection optimization problem is equation (5). We added a comment below the statement to highlight it.

7. The connection of the optimization algorithm to the optimization problem in feature selection is also not pointed out currently with sufficient clarity.

Response to the Reviewer. **We clarified the link between the optimization problem, the optimization method and the optimization algorithm in the introduction and in section 3, page 5.**

8. The convergence is not discussed theoretically. Of course, the convergence can be discussed experimentally.

Response to the Reviewer. **We have not discussed the convergence of the methods in this work, but we have discussed in our previous work. We put the citation links to the paper (section 1, page 2 and section 3, page 11).**

9. The connection of the application to the previous theory is not clear enough. More details are necessary for improved transparency.

Response to the Reviewer. **The connection of the application to the previous theory was put in the beginning to the experimental section. The author's previous work, published in ESwA, was mentioned, where the problems of multicorrelation forecasting were motivated by computational experiments.**

10. In this context, you should save the code of programs and datasets, and cite the link to them in the paper. This is useful for validation, and helps the above comment. The importance of this comment is related to the fact that similar optimization algorithms are reported in the literature; they report excellent results but cannot be tested. That is important in order to make the application transparent. Of course, it could work only in the reviewing phase, in order to avoid any possible problems.

Response to the Reviewer. **All the code and the datasets are available in open access. The reproduction and validation of the experiment is easy and it is highly appreciated by the authors. The proposed algorithms are available with the author's previous algorithms, which were published in ESwA earlier. The necessary references were added, too. All the references are ready to be tested and used.**

11. You should specify which are the parameters of the optimization algorithm, which of them should be selected by the user and which of them are random.

Response to the Reviewer: **Our methods has the following parameters:**

   1) **the matrices of pairwise similarities Q_x and Q_y**
   2) **the matrix of cross similarities between features and targets B**
   3) **the coefficients alphas for the objective terms**

The choice of (1) and (2) was discussed in subsection 3.1. The choice of (3) was discussed in Proposition 3.

12. The comparison with other optimization algorithms is also affected by the comment 10. Anyway, other values of parameters lead to different performance.

Response to the Reviewer: **The comparison of the codes was published in ESwA previously and the necessary links to these papers and the source code of our work were added to the manuscript.**

13. The highlights are very well formulated.

Response to the Reviewer. **Thank you for your kind review!**