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EUSIPCO 2015: review decision for your paper #1570105503

Nicholas Evans <evans@eurecom.fr> Fri, May 22, 2015 at 8:09 PM
To: Ehsan Eqlimi <ehsun.eghlimi@gmail.com>, Bahador Makki Abadi <B.Makkiabadi@ieee.org>
Cc: technical@eusipco2015.org

Dear Mr. Ehsan Eqlimi,

the review process of EUSIPCO 2015 is now complete. We are delighted to announce that your paper #1570105503 'An efficient k-SCA based underdetermined channel identification algorithm for online applications' has been ACCEPTED for publication. Many congratulations!

The reviews are included below and can alternatively be found at http://edas.info/showPaper.php?m=1570105503, using your EDAS username ehsun.eghlimi@gmail.com. Please incorporate the recommended changes into a camera-ready paper which must be uploaded to the EDAS website before 19th June 2015. A signed, scanned copyright form in PDF format has also to be uploaded to the EDAS website before the same deadline. Formatting and submission guidelines for camera-ready papers will be circulated next week with the PDF copyright form.

IMPORTANT: at least one author must register at a non-student rate (i.e. full delegate registration) in order that your paper be included in the proceedings. One registration shall cover a maximum of 3 papers. Further details will follow next week.

In the following weeks the technical programme will be made available on the EUSIPCO 2015 website. Please check the website for session and schedule details for your paper.

We look forward to seeing you in Nice!

Best regards,

Marc ANTONINI, Nicholas EVANS, Cédric RICHARD
EUSIPCO 2015 Technical Programme Chairs
http://www.eusipco2015.org

======= Review 1 =======

> *** Novelty and originality: Rate the novelty and originality of the work presented in the paper.
Some novel results on a subject well investigated (3)

> *** Technical content and correctness: Rate the technical contribution of the paper, its soundness and scientific rigour.
Minor flaws, but conclusions still believable (3)

> *** Relevance and Timeliness: Rate the importance of the topic addressed in the paper and its timeliness within its area of research.
Average (3)

> *** Quality of presentation: Rate the paper organization, the clearness of text and figures, the completeness and accuracy of references.
Well written (4)

> *** Comments and Recommended Changes: Comments to the author: please give your general appraisal and

indicate any changes that should be made to the paper if it is accepted.

This paper deals with the topic of Blind Mixture (or channel) Identification (BMI), which is itself linked to the topic of Blind Source Separation (BSS). More precisely, the authors considers the so-called undetermined case, i.e. the difficult situation when the number of observations is lower than the number of sources. The BMI and BSS tasks then become more different and the authors focus on BMI. They strongly rely on the approach initiated by Georgiev, which makes it possible to achieve underdetermined BMI when the sources have some sparsity properties (k - Sparse Component Analysis).

The authors provide a rather detailed overview of this type of approaches and then aim at achieving additional features as compared with previous works, especially in terms of:
- handling outliers,
- automatically detecting the number of subspaces,
- integrating two clustering stages.

The topic of this work is therefore of interest. However, I found the proposed contributions are only half convincing, especially because:
- The proposed methods involve some heuristics, in terms of the proposed procedures themselves and the different thresholds that they involve: see Th_1, Th_2, Th_3 respectively in Algorithms 1, 2 and 3. See also the tests "... < Th_3" and "... > 10^8 x Th_3" in Algorithm 3: why specifically "10^8 x ..." ?
- The authors do not say much about the influence of all these heuristics on performance. This includes the above-mentioned factor "10^8 x ...", but also all thresholds Th_1, Th_2, Th_3: their values are provided in the simulation section, without any comments. More importantly, this concerns the convergence properties / uniqueness of solution for the iterative algorithms proposed by the authors. One may especially be afraid that these algorithms may get trapped in local minima. The relevance of this question is confirmed by the fact that the authors state in Section 3.4: "in order to avoid having local search problem we try to choose subspace candidate vectors from more than one clusters, generated by online-clustering process, randomly". So: (i) this suggests that local minima may indeed be a problem and (ii) this random aspect of the approach motivates me to ask the authors about the convergence properties of their algorithms. This question is also motivated by the following comment:
- As stated above, the authors initially provide a rather detailed review of related approaches. However, amazingly, when they move to simulations in Section 4, they do not compare their approach with the above ones, but with another one, namely K-SVD. This comparison therefore does not seem to be the mot relevant one. Fortunately, the authors provide a few comments about the above related methods at the very end of Section 4, stating that they leave for this topic for a future publication. I regret this has not been included here because the attractiveness of the proposed approach as compared with related ones is not really highlighted from a theoretical point of view (e.g. theoretical convergence properties) and should therefore be assessed from an experimental point of view here. Moreover, the other methods are stated to yield some issues concerning local minima and this brings me back to my question about the performance of the proposed approach from that point of view.

As a conclusion, this paper deals with the difficult topic of underdetermined BMI. It contains some contributions which may make it relevant for this conference. However, I regret that its

contents in terms of (i) proofs of theoretical properties and/or
(ii) comparison to related methods concerning experimental performance
are rather limited.

The use of English language should also be improved at various points
of the paper.

======= Review 2 =======

> *** Novelty and originality: Rate the novelty and originality of the work presented in the paper.
Some novel results on a subject well investigated (3)

> *** Technical content and correctness: Rate the technical contribution of the paper, its soundness and scientific rigour.
Technically solid (4)

> *** Relevance and Timeliness: Rate the importance of the topic addressed in the paper and its timeliness within its area of research.
Average (3)

> *** Quality of presentation: Rate the paper organization, the clearness of text and figures, the completeness and accuracy of references.
Readable; could benefit from revision (3)

> *** Comments and Recommended Changes: Comments to the author: please give your general appraisal and indicate any changes that should be made to the paper if it is accepted.

This paper proposed several techniques to deal with several limiting points to K-SCA algorithm, namely subspace selective search to deal with outliers, bidding based clustering to deal with unknown number of sources, channel selective search for channel estimation, and online continuous selective channel identification for real-time application. The techniques are sound and somehow novel. Literal representation needs improvement. Comment: it is not clear how to select the thresholds that are used in proposed schemes.

======= Review 3 =======

> *** Novelty and originality: Rate the novelty and originality of the work presented in the paper.
Minor variations on a well studied subject (2)

> *** Technical content and correctness: Rate the technical contribution of the paper, its soundness and scientific rigour.
Minor flaws, but conclusions still believable (3)

> *** Relevance and Timeliness: Rate the importance of the topic addressed in the paper and its timeliness within its area of research.
Average (3)

> *** Quality of presentation: Rate the paper organization, the clearness of text and figures, the completeness and accuracy of references.
Substantial revision work is needed (2)

> *** Comments and Recommended Changes: Comments to the author: please give your general appraisal and indicate any changes that should be made to the paper if it is accepted.

The paper deals with sparse component analysis. Unfortunately, it is quite unclear and needs a major rewriting. Also, the novelty does not appear clearly. Finally, it seems that only a description of the algorithms is given, and no clear justification.

Precise comments

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* in the abstract: please define "SCA" the first time it appears
* in the abstract: "according to Georgiev's proof" -> the abstract should be self-contained
* in the abstract: "(A)" and "(S)" appear and have not been defined.
* introduction, p.1, col.2: "S is supposed to have a priori" -> I don't understand the sentence
* introduction, p.1, col.2: "UBSS" has not been defined
* p.2, col.1, bottom: "based on Georgiev's proof" -> the paper should be self contained.
* p.2, section 3: "UBI" has not been defined
* p.2, section 3: "the smallest (equal to zero) Eigen-value" -> do you mean smallest or equal to zero?