

Dear All

Here are comments on each question made by the KDMille reviewers about the article "Spatiotemporal Anomaly Detection Applied to Flow Measurement Points in Natural Gas Production Plants". We have included a literature review section where the related works have been explained in more depth. The largest number of JIDM pages allowed this extension.

Review 1

Question 1: The article is well written and structured, but it lacks the section of related works.

Response: We have included a literature review section where the related works have been explained in more depth. The largest number of JIDM pages allowed this extension.

Question 2: The proposed model was well elaborated and explained, as well as the methodology used. The statistical methods used were well based and applied. However, it would be an improvement to include the Precision, Accuracy, and Recall metrics in the data presented in the confusion matrices (Table II).

Response: Suggestion accepted. Metrics added in Table II.

Question 3: Increase the resolutions and fonts of the texts of the images.

Response: All images have been improved.

Review 2

Question 1: The article proposes the use of dynamic Bayesian networks for the detection of anomalies. The problem approached is well defined and the proposed solution also. The experimental methodology used is coherent. Related works were not showed.

Response: We have included a literature review section where the related works have been explained in more depth. The largest number of JIDM pages allowed this extension.

Question 2: Since the data are numerical why do they require that the probability found be 0.9 or 0.1 for class determination?

Response: We wanted to present the diagnostics of each measurement point and so the inference component was created. The probability distribution was based on the number of anomalies present in the data set. The text of the article has been extended to improve this understanding.

Question 3 : Na definição de redes Bayesianas é descrito Tabela de Probabilidade Condicional, que apenas se aplica para variáveis discretas, que não é o caso do trabalho proposto. Inclusive na apresentação da proposta fala-se em função de densidade. A seção 2 precisa ser revista para se adequar ao que está sendo abordado pelo artigo.

Response: Including definition of continuous Bayesian networks and the probability distributions adopted in section 3.

Question 4: Text erros.

Response: Corrected.

Review 3

Question 1: The article presents an anomaly detection strategy in natural gas production plants. The proposal is based on a variation of Bayesian Networks and achieved good results when applied to data from a real but reasonably small plant of natural gas production.

A first criticism of work is its contribution in terms of advancement of the state of the art. As far as I can evaluate, the major contribution of the work is in the instantiation of an already existing model for a scenario that may be unprecedented, although the authors have not argued in this sense.

Response: Improved text to make the contributions of the work clearer.

Question 2: The second criticism is in relation to the size of the problem dealt with. It is unclear whether the same approach would continue to work for larger scale problems. I suggest that authors look for other problem scenarios or even scale them up syntactically so that we can gauge how well the proposal works.

Response: Tests with other plants included in future work

Question 3: The third criticism is about somewhat arbitrary design decisions, such as the adoption of second-order Markov relations. I think this definition should be based on some kind of characterization, or at least an empirical calibration, that has not been presented.

Response: The decision of the parameters were evaluated in the first experiment. The second experiment was based on the best parameterization. The text has been greatly improved and we hope it is now clearer.

Question 4: Text erros.

Response: Corrected.

Best Regards,

Hadriel Lima

Flávia Bernardini