Paper Review

Andres Calderon
acald013@ucr.edu

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1 Review form[1]

1. Submission Category [as indicated by authors]

   I Regular Research
   II Experiments and Analyses
   III Innovative Systems and Applications
   IV Vision

2. Relevance to SIGKDD

   I High
   II **Adequate**
   III Should submit to alternative forum

3. Overall Rating

   I Strong Accept
   II Accept
   III Weak Accept
   IV Weak Reject
   V **Reject**
   VI Strong Reject

4. Justification of your overall recommendation (one paragraph)

> The paper introduces a novel approach to detecting multiple periods for events from time series. It is successful in proving the importance and complexity of the problem as well as proposing a suitable solution. However, there are substantial weaknesses during the experimental evaluation which deserve considerable attention.

5. List major strong points of the paper (if any)

> - It states clearly the importance of multiple periodicity detection under particular and real scenarios such as incompleteness and irregularity of the observations.

[1] Selected option is in bold.

- It presents a set of definitions and equations that help to develop a scoring function to measure the quality of the periods.
- It proves that finding the timeslots which maximize the scoring function is an NP-hard problem.
- It proposes a suitable heuristic algorithm to solve the problem.

6. List major weak points of the paper (if any)

- The evaluation section is strongly based on synthetically generated data sets. Although it states the steps for data generation, it fails to explain why it uses specific parameters and sets default values. It also assumes uniform distribution and probabilities which certainly deserve more explanation.
- Even though it considers real data sets, the discussion around them is rather simple. It focuses on finding just two particular periods and it claims that TiCom is the only one able to find them. It is unknown if there are more periods in the datasets that TiCom is unable to find but other methods could.
- The study is not reproducible. Neither data nor implementations are available for evaluation.

7. Significance

   I High impact
   II **Substantive impact**
   III Incremental value

8. Novelty

   I Highly Creative
   II **Interesting Approach**
   III Routine Exercise

9. Technical Merit

   I Strong
   II Acceptable
   III **Questionable**
   IV Major errors

10. Presentation

    I Clear
    II **Needs improvement**
    III Unreadable

11. Detailed Evaluation (Contribution, Pros/Cons, Errors); please number each point

(a) It states challenges, problem and contributions clearly in section 1.
(b) Pros: It proposes a general framework for periodicity detection, proves that deals with the current problem is not trivial and design a (theoretical) effective and efficient solution.
(c) Cons: It fails to evaluate appropriately the proposed algorithm.
(d) There is a typo in definition 4. It should be "... *pattern p* ..." instead of "... *patter p* ...".

(e) Figure 3 does not match the example from figure 2. For example, the text refers to timeslot $P_{[7:2]}$ but the figure shows $P_{[7:1]}$.

(f) First paragraph in section 4.2 refers to "Definition 7" which does not exits. It should be Definition 6.

(g) In Algorithm 1, the symbol $\emptyset$ should be more appropriate to denote the empty set instead of Φ (phi).

(h) There is a typo in last paragraph of section 4.2. It should be "*... we can reduce the vertex cover problem ...*" instead of "*... we can reduce the the vertex cover problem ...*".

(i) Last paragraph in section 4.3 refers to "Equation 6" which does not exits.

(j) It would be very useful additional examples and elaboration in the concepts explained at the end of section 4.3.

(k) There is a typo in paragraph 4 of section 5.2. It should be "If aligning the observations ..." instead of "If aligning the obesevations ...".

12. Revision Recommendation (Do you think the submission can meet SIGKDD standards with a limited revision?)

I Yes

II **No**

III Already meets SIGKDD standards

13. If revision is recommended, list specific revisions you seek from the Authors

- The experimental section needs to be rethought. It would be important to apply similar experiments but now focusing on real data.

14. Your confidence in this review

I Expert

II High

III **Medium**

IV Low