View Reviews

Paper ID
6593

Paper Title
Algorithms for Estimating Trends in Global Temperature Volatility

Reviewer #1

Questions

1. [Summary] Please summarize the main claims/contributions of the paper in your own words.
The paper proposed methodology to estimate the temperature volatility in a global scale spatial-temporal data. It formulates the problem by considering both spatial and temporal smoothness. For an efficient and feasible optimization, it proposed two optimization algorithm based on ADMM, which is consensus ADMM and linearized ADMM. Experiments on both simulated data and real data showed the proposed formulation can capture the trend and leads to smoothed solution, while the optimization algorithm (esp. linearized ADMM) is feasible in practice.

2. [Relevance] Is this paper relevant to an AI audience?
Of limited interest to an AI audience

3. [Significance] Are the results significant?
Moderately significant

4. [Novelty] Are the problems or approaches novel?
Somewhat novel or somewhat incremental

5. [Soundness] Is the paper technically sound?
Technically sound

6. [Evaluation] Are claims well-supported by theoretical analysis or experimental results?
Sufficient

7. [Clarity] Is the paper well-organized and clearly written?
Good

8. [Detailed Comments] Please elaborate on your assessments and provide constructive feedback.
The paper is in general well written and technically sound. The main contribution of the paper is the problem formulation inspired from L_1-trend filtering algorithm and application of consensus ADMM and linearized ADMM to the proposed formulation due to the nature of large-scale optimization.

However, one concern is that on real data, it is hard to quantitatively evaluate the results. And although the simulated experiments has some comparison with other formulation that either only takes spatial smoothness or only takes temporal smoothness into consideration, the real data experiments is still not very convincing. Whether the problem itself has enough audience for AAAI is also another concern.

9. [QUESTIONS FOR THE AUTHORS] Please provide questions for authors to address during the author feedback period.
See above concerns.

10. [OVERALL SCORE]

6 - Marginally above threshold

11. [CONFIDENCE]
Reviewer is knowledgeable but out of the area

Reviewer #2

Questions

1. [Summary] Please summarize the main claims/contributions of the paper in your own words.
This paper develops new algorithms for detecting trends in spatio-temporal variance, with an application to temperature data. The methods are general, however, and could be applied to any spatio-temporal series where we are interested in examining its volatility.

2. [Relevance] Is this paper relevant to an AI audience?
Of limited interest to an AI audience

3. [Significance] Are the results significant?
Significant

4. [Novelty] Are the problems or approaches novel?
Somewhat novel or somewhat incremental

5. [Soundness] Is the paper technically sound?
Technically sound

6. [Evaluation] Are claims well-supported by theoretical analysis or experimental results?
Very convincing

7. [Clarity] Is the paper well-organized and clearly written?
Excellent

8. [Detailed Comments] Please elaborate on your assessments and provide constructive feedback.
I think this paper is a very excellent paper, addressing some important questions in climate science. It's clearly written, the problem is an important one, and the solutions are well-described. However, it's a paper I would expect to read in a climate sciences journal rather than in AAAI.

9. [QUESTIONS FOR THE AUTHORS] Please provide questions for authors to address during the author feedback period.
The authors might be able to assuage the concern that the paper is too narrow by giving a few examples of other extant problems across the sciences to which their methodology could be applied. Outside of the climate sciences, where else are we primarily interested in the second moment of the data?

10. [OVERALL SCORE]
7 - Accept

11. [CONFIDENCE]
Reviewer is an expert in the area

Reviewer #3

Questions

1. [Summary] Please summarize the main claims/contributions of the paper in your own words.
This paper applies l1 trend filtering on the variance instead of the mean, with additional temporal and spatial constraints. Then the corresponding linear and consensus ADMM algorithms are proposed.

2. [Relevance] Is this paper relevant to an AI audience?
Of limited interest to an AI audience

3. [Significance] Are the results significant?
Moderately significant

4. [Novelty] Are the problems or approaches novel?
Somewhat novel or somewhat incremental

5. [Soundness] Is the paper technically sound?
Technically sound

6. [Evaluation] Are claims well-supported by theoretical analysis or experimental results?
Sufficient

7. [Clarity] Is the paper well-organized and clearly written?
Good

8. [Detailed Comments] Please elaborate on your assessments and provide constructive feedback.
1. For consensus ADMM, can you provide results on how much time is spend on the communication step and how much time is spent on the computation on each core. So readers can get a sense which part is dominant.

9. [QUESTIONS FOR THE AUTHORS] Please provide questions for authors to address during the author feedback period.
1. Can authors elaborate on why L(\lambda_s,\lambda_t) is used as the model selection criterion, it is very heuristic, and implies that equal weight (1:1) is put on loglik and model complexity.

2. For Indianapolis are shown in the lower right panel of Figure 5. The annual average of the estimated SDs shows a linear trend with a positive slope. If you change the model selection criterion, whether you will still get this trend, can you demonstrate that?

3. Can you provide the convergence rate for the ADMM algorithms?

4. Can you provide the computing time for the algorithms?

10. [OVERALL SCORE]
7 - Accept

11. [CONFIDENCE]
Reviewer is knowledgeable in the area