Atmospheric
Measurement
Techniques
Discussions

Interactive comment on "Mobile sensor network noise reduction and re-calibration using Bayesian network" *by* Y. Xiang et al.

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The paper by Xiang et al. describes an algorithm to improve the dataset of low-cost sensors, reducing the measurement noise and correcting for the sensor drift. The method is presented first, and its benefits are then illustrated in a field campaign. The study is innovative and contains interesting materials, which are relevant for the community of atmospheric science, and well in the scope of AMT. There is however some room for improvement, in particular regarding the presentation. I recommend publication after the the authors have taken into account the following remarks.

General comments

The paper is based on the phd of the first author, but the latter document is not in

the references. This phd should be properly quoted in the introduction. I agree with Referee 1 that the text should be made more concise, but the conclusion expanded.

The main quantitative finding of the study stated in the abstract ('34.1% and 4 times more') is related to the dataset collected during the campaign, this is not a general theoretical finding. This should be made clear in the abstract and it is not. Please rephrase.

As the paper is didactic, I recommend adding the corresponding equations from section 5.2, after "the probability inference of the three ground truth nodes can be calculated using the input of the four actual sensors. The value with the highest probability is considered as the estimated ground truth."

Adding the equations would be useful for the reader who want to try the method and it would help to clarify the text itself (for instance, when you introduce the drift you can mention which parts of the equation changes)

Specific comments

Fig 1 and Fig 6 are redundant, fig 6 being just a detailed version of fig 1. Please consider removing one of them and adapting the text in consequence.

The authors write 'In this section' much too often, in particular for small subsections. This does not help the reading and should be rephrased or merely removed. For instance, the two first sentence of subsection 7.1.3 should move to the intro of section 7, the intro of section 7.1 should just be removed since it s a repetition of the intro of section 7.

The author also use at several places 'in the figure' and 'in the table' (e.g p 8978, l 22), it s unclear and should be 'in Fig. x', 'in table x'.

p.8979, l.17 'the reading of the temperature influence them all' -> not clear, to me it is the temperature who influences the other sensors, its reading is just correlated with the other sensors. Can you comment?

The Algorithm 1 on P 8985 is not clear and is redundant with Fig 6 and Fig.1. Again, it would be more useful to have some equations.

P. 8987 Please indicate the latitude/longitude of the Denver station. Please also indicate the uncertainty on the reference measurements there. The authors should be more explicit that they assume these reference measurements as 'the ground truth'.

In the figures with the networks, it s the same symbol (T) for 'temperature' and 'true', this is very confusing and should be modified

In general it would help the reading if the captions were more explicit, explaining at least the symbols used

Fig 8: this is a very important figure of the paper but it is barely visible. The size of the figure should be increased, eg putting all the plots aligned in one column. And the author should add the name of the species clearly visible on top of each plots

Technical corrections

p. 8974 l.22 'the rest of this section' -> 'the rest of this paper'

p. 8975 l.9 'the conclusion of the atmosphere research is affected greatly because of the noise caused the sensor drift' -> rephrase

p. 8988 l 24 'we choose' -> we chose

p 8990 l 9 'it require' -> it requires

p 8990 l 27 'all the four approaches' -> all the three ?

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