[Associate Editor's comments to the authors]

Your paper entitled "Sparse High-noise GPS Trajectory Data Compression and Recovery based on Compressed Sensing" has been reviewed. Based on the reviewers' comments and my own reading, the paper has been found to be suitable for publication in IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences, subject to major revision.

Specifically, the two reviewers raised major concerns for experimental and analytical contributions as well as the basic modeling/framework, which I also concur with. The reviewers' comments are included below. Therefore, I would like to ask you to revise your paper by elaborating on the issues along with a point-to-point response note.

[Reviewer A's comments to the authors]

Presentation is quite poor overall.

Please consider revising.

Some technical comments

(1) Section 4.3: From Equation (6) to (7), L0 norm is substituted with L1 norm. This is indeed a common practice to induce sparsity, but as the section is meant to be expository, it deserves either more discussion or citation. The current presentation is quite poor and looks hand-waving.

(2) Section 6.1: Please note that data itself contains noise, which may not be Gaussian in real life, and you are adding artificial Gaussian noise. It could have been better if synthetic or sanitized data was used for a controlled experiment.

(3) Section 6.2: It says Gaussian noise is added to the data. However simple the error is, please consider writing down the explicit error model. Even a single equation showing additive i.i.d. Gaussian error term should clarify the setup.

(4) Section 6.2: Mean filter is stated to be sensitive to noise. This statement is not supported by the graph.

(5) Section 6.2: Kalman filter is to grow error "exponentially". This is not supported by the graph, although the graph shows growing error. Exponential error growth is a technically precise statement, and it needs to be backed by the data.

(6) Section 6.2: Kalman filter is probably the optimal mean-variance estimator with Gaussian noise. The fact that Kalman filter performed so poorly in your Gaussian setup, even in the low noise setting, deserves more discussion or analysis.

(7) Section 6.4: Instead of a small table with 6 timings, I would like to see asymptotic runtime analysis and real world wallclock times at different settings. Section 6.4 shows the flaw with the proposed algorithm (runtime is two orders of magnitude slower), and this section should not be neglected.

[Reviewer B's comments to the authors]

As I know there are several works about the recovery of GPS signal based on sparse recovery framework (compressed sensing or matrix completion), however it seems that this article does not show its novelty or relationship to other works. So, it is desirable to clarify the connection between your work and the previous works from others, and add some explanation about the novelty of your work.

In technical detail, I think that there are some things to correct.

(1) Strictly speaking, the L1 norm and the L0 norm are not equivalent. However, the most important result from [27] is that the solution with respect to L1 norm and the solution with respect to L0 norm are the same, in some desirable setting (e.g. when the sensing matrix has a small RIP constant).

(2) Many of results on compressed sensing were established by using the RIP condition, and it is verified that random matrices of certain kinds have a good RIP. In the recovery of GPS information, does the sensing matrix have a good RIP?

(3) There are some sentences to be corrected such as :

- From the 8th line from the bottom in the right part of page, maybe "." should be replaced by ","

- 3rd line and 4th line from the above, in the left part of page 6

- From the 15th line from the bottom in the left part of page 6, the sentence is not be clearly

written.

(4) What kind of compressed sensing method did you use, in your algorithm? Is there any reason to apply that method?