# Review#1 - AUTCON-D-14-00134 - Automated Daily Pattern Filtering of Measured Building Performance Data

This paper presents a new tool 'Day Filter', an analysis process for analyzing the sensor data generated from BMS. The motive of the research is good, and is useful for effectively analyzing the huge amount of data generated by the Energy Management Systems. Two case studies were also presented to analyze cooling energy and electrical energy from two buildings respectively.

With minor modifications, this paper can be accepted for publishing with Automation in Construction

General comments for further improvement

* Literature Review included background and related works nicely. However, the authors can further enhance the section which describes the need of a software like this. Page 4 and 5 explains this. But, we feel that little more stress needs to be given in explaining the difficulties faced presently in analyzing the data.
* Page 10 and 11: Conversion of the building raw data into SAX formation requires to be given more information particularly regarding the string representation. For instance, the method of coining the strings aaaa , abaa , acba etc needs to be explained atleast for some cases for all readers to follow the further explanations.
* Page 14 - Visualization part needs to be explained further with the presented Figure 6. Visualization is the place from which the results are inferred and rather than directly moving to the case studies, there should be more explanation in that part regarding the method of inferring the results from these graphs.
* Limitations of the model (if any) need to be discussed.
* After doing the two case studies, whether any changes were able to make to those buildings based on the results? Whether those changes resulted in any energy reductions? If the authors have this information and if they can answer these questions, it will add more meaning to this research.

# Review#2 - AUTCON-D-14-00134 - Automated Daily Pattern Filtering of Measured Building Performance Data:

This article provides potential automated data procedures for examining the routine operation profiles of whole building power consumption. Overall, this is a good paper and well written.

My recommendation is that this paper should be accepted if some minor points are made clearly as follows:

* On page 107, the year of reference No. 10 was published in 2005, not in 2004. Please make sure it.
  + The reviewer is correct in pointing out this discrepancy and it has been update with the correct date, edition, and page numbers. A double check of the other references has been completed.
* From line 109 to line 110, the authors do not study enough references in analytical-based FDD. The example in [19], it is just one example using the simulation models in the process. However, another method called decoupling-based technique [Li and Bruan, 2003 and Zhao et al, 2014] has been applied in the AFDD application of rooftop units and chillers, respectively. This technique uses virtual sensor techniques based on low-cost manufacturing data and does not require simulation tool. The disadvantage of the method is not convenient for large data systems and is required solid-backgrounds of physical meanings and relations of an applied system. Please make sure your statement. Is it correct?
* From line 113 to 114, please give a clear problem statement why data-driven area is a major research focus? What are differences between data-driven and previous two methods leading to mainly significant points of view in your study?
* On line 135, it is not clear what exact differences are between your application and AFDD in defective equipment. If your application is applied in automatically cleansing building data systems, fault equipment data caused by routine operations are also included in the data system. Have you studied this point if the data of some fault equipment operations occur and are included in building data system? Please clarify the point.
* On line 165, it is not clear what challenges you has developed. What point does a new process differ from Viztool? You said a lack of tools or processes being similar to Viztool. Do you mean you just develop a similar tool to Viztool for the building application?
* From line 260 to 261, could you explain why k-means are suitable than others for your application?
* Based on Fig, 4 and 5, you clearly explain how the process perform given by the example. However, it lacks of the explanation for Fig. 6 with the same application. Please explain more.
* Based on line 306, you do not mention how to appropriately select a threshold for each application.
* From line 309 to line 317, can you tabulate all motif and discard candidates in Table for conveniently understanding by readers. How do you obtain or generate the patterns of representative of days in a school?
* From line 318 to 331, could you explain how to systematically conduct the procedures in Table? The interpretation of the procedures is not clear and not easily applied by new readers.
* For item 4.2, please do the same things as the first case study (item 4.1).
* In Fig. 10, what are 0, 1, and 2,3,4,5? Also, with the same paragraph, please give more details of three heating and cooling season since each case will match to the order of each number provided in Fig. 10. Please explain more clear for the second case study.
* For item 5 in discussion, I recommend you to combine it with item 4. Please discuss the results and what you found after you concluded the results for each case study in item 4.
* On line 417, how do you define the definition of data quality? It is based on the accuracy of measurement or fault-free data (without fault operations of machine affecting total power consumption). Also, what are the limitations of your application? For example, if data include fault operation data of building equipment, your application cannot identify or analyze what fault situations occur in building operations.

# Review#3 - AUTCON-D-14-00134 - Automated Daily Pattern Filtering of Measured Building Performance Data

An interesting and useful application of a technique developed in another (perhaps more general) domain.

Before publication, I believe the following must be addressed:

* It's not clear to me what the clustering step is for and how it differs from or compliments the SAX transformation and daily profile tagging/filtering. I got little sense that this step provided any added information either from the description in section 3 or the case studies in section 4. The discords and motifs in the case studies appear to provide information and have value but again, I don't see the value in the clusters. What does it mean to be in cluster 0 or cluster 1? Unless a case can be made that this step contributes to detecting abnormal or problematic operation;; gives insight into building operation;; or supports decisions, it should be left out.
* While on clustering, for the first case study (Singapore building), I don't see how cluster 1 is "strongly prevalent on the weekends" (line 337);; to my eyes it appears more prevalent on the weekdays. This should be clarified.
* Section 5 could be expanded. The treatment of how the parameters impact results is welcome and necessary, but the discussion is mostly qualitative and does not assess how changes in these parameters and corresponding changes in results might change a user's interpretation of the data. This section comes across as a little unconvincing and its conclusions need greater support.
* On line 405, use a different phrase than "significant statistical". This phrase implies that a rigorous and quantitative statistical test of significance was conducted - a standard and well defined technique - yet the only analysis was a visual inspection.

The following should at least be discussed a full treatment need not be included in this paper:

* Given the objectives of using the fewest parameters possible and "let the data itself speak to us" it would be helpful to have some sensitivity measure indicating how parameter changes cause interpretation or discord detection changes - with a low score on such a measure being more desirable. Some guidelines are offered and while these seem reasonable they are not rigorously supported - although I recognize that providing rigorous generalized rules may be difficult to do for this technique and application and thus would be a matter of experience in the field.

The following are suggestions that might enhance the paper but not something I find absolutely necessary:

* As motivation for this work, it might be helpful to discuss briefly how much performance gaps are due to faulty/discordant operation and how much is due to overly optimistic modeling/simulation during design, uncertainty, etc. Also interesting would be to quantify how much this approach narrowed a performance gap: are there any design-stage performance predictions for the case studies (although this may be more appropriate for a follow up study)?
* Section 6, the conclusion could perhaps be more reflective of section 1.