Your Submission

Automation in Construction <autcon@elsevier.com>   Sun, Jun 8, 2014 at 9:39 PM
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Ms. Ref. No.: AUTCON-D-14-00134
Title: Automated Daily Pattern Filtering of Measured Building Performance Data
Automation in Construction

Dear Mr. Clayton Carl Miller,

The initial review process regarding your manuscript entitled Automated Daily Pattern Filtering of Measured Building Performance Data has been completed.

Your paper has been determined to have a potential for possible publication. I invite you to revise and resubmit your manuscript by Aug 07, 2014.

For your guidance, reviewers' comments are appended below.
I look forward to hearing from you again soon and to receiving your revised manuscript. Thank you for your efforts and your contribution to Automation in Construction.

If you decide to revise the work, please submit a list of changes or a rebuttal against each point which is being raised when you submit the revised manuscript.

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Yours sincerely,

Miroslaw J. Skibniewski, Ph.D.
Editor-in-Chief
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Reviewers' comments:

Reviewer #1: 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.

Reviewer #3: 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.