Reviewer’s report

Title: A classification framework for exploiting sparse multi-variate temporal features with application to adverse drug event detection in medical records

Version: 0 Date: 20 Jul 2018

Reviewer: Cynthia Sung

Reviewer's report:

The problem that the authors wish to solve very interesting and proposed solution quite intriguing. However, the computer science and mathematics in this paper are not my area of expertise. Hence I am reluctant to pass judgement on the paper for a journal of Bioinformatics,. It would be more appropriate if the article were additionally reviewed by someone who has deep Computer Science or Bioinformatics knowledge.

I appreciate that temporal information is included in the methodology, and AUC values are impressive. There *are* other papers where some temporal information of events are modeled (Drug Safety 2013, Vol 36 Suppl 1 contains some of those papers, also Pharmacoepidemiology & Drug Safety 2011, 20:598-607), so comparison to some of those papers would be apropos. Does the methodology include information about which drug the patients were exposed to, and if not, that seems to be a major missing piece of information. Another concern is the reliance on diagnosis coding to create labeled data for ADEs, as oftentimes the ADE is not the most important diagnosis of the patient and therefore, the negative set may actually contain some positives. Was a sampling of the records reviewed by a clinician to verify the categorization in Table 1? In Table 3, I am surprised by the list of important multivariate features identified by the model, do these make sense from a clinical perspective? All authors are computer scientists; some input from a clinical domain expert is needed to give perspective about clinical validity and utility.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Unable to assess

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes
Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Unable to assess

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
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Quality of written English
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