ICPRAM 2022 - Paper #22

Paper Title: *A Performance Analysis on Patient Severity score based on Supervised and Unsupervised Learning*

Reviewer *#1*

General Assessment (Please assign scores using the following criteria (1=weakest; 6=strongest))

Relevance (Paper fits one or more of the topic areas?): 6
Originality (Newness of the ideas expressed): 2
Technical Quality (Theoretical soundness/methodology): 2
Significance (Is the problem worth the given attention?): 5
Presentation (Structure/Length/English): 1
Overall Rating (Weighted value of above items): 2

Improvement Suggestions (for authors to consider in the camera-ready version. Additional detail in "Observations")

Abstract and Introduction are adequate? No
Needs more experimental results? No
Needs comparative evaluation? No
Improve critical discussion ? (validation): Yes
Figures are adequate ? (in number and quality): No
Conclusions/Future Work are convincing? No
References are up-to-date and appropriate? No
Paper formatting needs adjustment? Yes
Improve English? No

Detailed comments to authors, including aspects that must be improved in the camera-ready version of the paper:

This paper was submitted as a regular paper to the Theory and Methods conference area. It deals with applications of supervised and unsupervised learning to predict patients' severity score. As such, it fits several ICPRAM topic areas.

The authors should consider the following comments:

- Several keywords are repeated in the list of keywords. Please remove duplicates.
- Please try to avoid vague formulations like "..aimed at predicting the severity of patients.." given in the abstract. Are you predicting severity score of patients or severity of patients' disease, illness etc.?
- Covid−19 is in the focus of introduction. However, the rest of the paper doesn't deal with this disease specifically . This may be confusing for the reader.
- Section 2: Proposed Model, unclear objective: "The objective is to determine the influence of supervised and unsupervised learning on patient severity scores while identifying them." Does machine learning have an influence on patient severity scores? Which type of score or scores are in the focus here, e.g. disease activity score (DAS) in rheumatology patients and/or some health score? Please be more specific.
- In the same section, several clustering techniques and PCA are named "supervised learning".

- Section 2.3.1: References "[5]" (in K−Means paragraph) and "[13]" (in Spectral Clustering paragraph) are given. This is not a citation style used at the ICPRAM conference and it is unclear which papers are cited here.
- Figures are not referred to in the text.
- What is "Value Sample" column in Table 1? Probably not mean or median (value sample for the variable age is 12).
- In figure 1, a split is mentioned into features and a target. Target is defined in section 2.1 as " whether the patient is in or out of care". What does this mean? Inpatient vs. outpatient? In acute need for care vs. no need for immediate care? The target should be defined more precisely.
- According to section 2.1, only laboratory data was available but table 1 also shows some demographic data.
- In conclusion it is stated that patient severity scores were predicted. However, the target was binary (and unclear what exactly it related to). Patient severity scores are not binary in nature, although they can be categorized. If this was done, the information should be added to the paper.

ICPRAM 2022 - Paper #22

Paper Title: *A Performance Analysis on Patient Severity score based on Supervised and Unsupervised Learning*

Reviewer *#2*

General Assessment (Please assign scores using the following criteria (1=weakest; 6=strongest))

Relevance (Paper fits one or more of the topic areas?): 4
Originality (Newness of the ideas expressed): 2
Technical Quality (Theoretical soundness/methodology): 3
Significance (Is the problem worth the given attention?): 2
Presentation (Structure/Length/English): 3
Overall Rating (Weighted value of above items): 2

Improvement Suggestions (for authors to consider in the camera-ready version. Additional detail in "Observations")

Abstract and Introduction are adequate? Yes
Needs more experimental results? No
Needs comparative evaluation? No
Improve critical discussion ? (validation): No
Figures are adequate ? (in number and quality): Yes
Conclusions/Future Work are convincing? Yes
References are up-to-date and appropriate? Yes
Paper formatting needs adjustment? No
Improve English? No

Detailed comments to authors, including aspects that must be improved in the camera-ready version of the paper:

The key problem is that it is quite fair and common the supervised learning should be better than unsupervised learning methods. The Originality is quite small.
I think authors should consider comparing supervised learning methods, then find the more suitable one. And find the more suitable one among unsupervised learning approaches.

ICPRAM 2022 - Paper #22

Paper Title: *A Performance Analysis on Patient Severity score based on Supervised and Unsupervised Learning*

Reviewer *#3*

General Assessment (Please assign scores using the following criteria (1=weakest; 6=strongest))

Relevance (Paper fits one or more of the topic areas?): 6
Originality (Newness of the ideas expressed): 4
Technical Quality (Theoretical soundness/methodology): 3
Significance (Is the problem worth the given attention?): 5
Presentation (Structure/Length/English): 3
Overall Rating (Weighted value of above items): 3

Improvement Suggestions (for authors to consider in the camera-ready version. Additional detail in "Observations")

Abstract and Introduction are adequate? Yes
Needs more experimental results? No
Needs comparative evaluation? No
Improve critical discussion ? (validation): No
Figures are adequate ? (in number and quality): No
Conclusions/Future Work are convincing? Yes
References are up-to-date and appropriate? Yes
Paper formatting needs adjustment? No
Improve English? No

Detailed comments to authors, including aspects that must be improved in the camera-ready version of the paper:

The paper deals with important problem, however, it is not clearly written concerning the experiments.

More information should be given about the dataset. A specific EHR dataset is mentioned. How many instances were considered, how many attributes (from Table 1, I guess 10 attributes). Two classes were considered (for supervised learning). What was the proportion of the cases in both classes? The full information about the dataset should be given in 2.1.

Sadikin, M. (2020). Ehr dataset for patient treatment classification . You should complete the description by: DOI:10.17632/7kv3rctx7m.1".

What were the parameters for the methods considered? For example, for N−kk? For other methods?
In general, the experiment is poorly described.

Fig 4. − dentogram − is it a general dentogram or dentogram concerning the EHR data?

Very small descriptions in Fig. 1 and Fig. 10.

Figures 2 and 3 – there is no explanation of WCSS.

Page 3, left column – EDA is not explained.

Literature – not full data is given. For example:
Acharya, T. (2020). Understanding feature extraction using correlation matrix and scatter plots." – What about the Editor of the book(?), maybe a paper? Maybe a webpage (a link should be added then).
Many positions in Literature have such descriptions. Please, correct it.