Review report for " A Log-Linear Model Approach for Eyewitness Identification Data" by Amanda Luby

Jining Qin

January 29, 2016

Summary

The ROC approach, based on a 2 by 2 contingency table analysis, is usually used in classification problems where the predictions of a classifier fall into four categories. The approach is also adopted in analysis and evaluation of eyewitness identification procedures. In the first three sections of this paper, the author provided brief introduction to the ROC approach, description of available data, as well as problems with the ROC approach. Most of the analysis doesn't include appropriate measurement of uncertainty in its evaluation.Furthermore, in a eyewitness identification problem, the outcome is a 2 by 3 contingency table. The calculation of false alarm rate therefore should be adjusted for the situation. Also, under the lineup identification scheme, ROC turns out to be an unsuccessful data compression method in the sense the two quantities (HR, FAR) preserved in an ROC curve are not enough to recover two useful quantities, i.e. Positive Predictive Value and Negative Predictive Value. That gives motivation for proposing the log-linear model which would avoid some of these shortcomings and address the analysis and evaluation of eyewitness identification problem better.

General comments

The contents are very good and clearly presented (if my summary above does capture what the author wanted to deliver through these sections). I think in the first three sections I got what the author is trying to get across. However, I think reader's mental energy can be saved even more by making some improvements to the presentation.

One point that needs improvement is the titles of subsections in section 3 (possibly also the title of section 3 itself). Firstly, the titles make much sense to a reader who is glancing over the table of contents. Also, these titles are not of the same nature. If the section is supposed to be the ROC approach and its problems (which, by the way, maybe a better title for this section), then the subsections may be better named lack of uncertainty measurement, problematic calculation of false alarm rate, failing to capture important information beyond two quantities, or something like that. It can be also about what should be done about the ROC approach, then incorporating uncertainty is fine, the latter two should be something like calculating correct (or generalized) false alarm rate, extending the method beyond two quantities.

The structure of section 3 is also a bit confusing to me. I think it might help to have a summary paragraph under the section title, maybe after the introduction to classical ROC method. Also, I think the part under the section title is a little too long. It might be easier to

read if there is only a brief introduction to ROC method, then a paragraph summarizing the problems with it, and then the subsections describing the problems and possible fixes in detail.

Minor comments

There are lots of abbreviations in the text and they can be confusing at times. I'm not sure whether TA, TP are defined in advance. They seem especially confusing since they mean other things under usual context.

In the FAR formula on page 7, should the second item in the numerator be "# Filler ID's (TP)"?

The third paragraph of 3.3 seems unfinished (or just missing a period?).

Is the first sentence of fourth paragraph, section 3.3 upside down? I mean, I think HR is determined by the top row and FAR is the bottom row.