FairScore (v1) User's Guide

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1 Background and History

FairScore is a statistical program originally developed for normalizing scores in law school moot court competitions. The motivating problem is that different students face different sets of judges in such competitions, raising fairness concerns over the possibility of being assigned to a particularly "lax" or "harsh" panel of judges. One can imagine the problem surfacing in a variety of other contexts, and the hope is that others will find FairScore helpful for their scoring issues as well.

The statistical theory behind the program is described in Cheng & Farmer (2013).[1] Conceptually, the program uses a model frequently used in educational testing known as the Rasch model. The model assumes that observed scores are a function of the ability of the student, the generosity of the judge, and other contextual information — for example, whether the student was arguing for the petitioner or the respondent, or the type of room in which the argument was held. The goal is to use the observed scores and other data to isolate the ability of the student, which is then reported as the normalized score.

The FairScore model was developed by Ed Cheng. It was first applied during the 2012 Vanderbilt Law School Intramural Moot Court Competition by Janna Maples and Scott Farmer, and has been used by their successors for all Vanderbilt moot court competitions since, both intramural and interscholastic. The web-based FairScore program was developed by Yaohai (Peter) Xu. FairScore runs using R and JAGS. The FairScore website was developed by Sforzando Designs, a Nashville web design start-up, and is hosted on Squarespace.

2   Quick Summary

The following are the main steps for using FairScore:

1. Register for Access Code

2. Fill in the scoring template file (**InputScores.xlsx**) with the raw data from your competition

3. Upload the score data and run the model on the FairScore website

4. Download the desired output files, especially the normalized score file (**ResultNormScores.csv**)

Each of these steps will be described in greater detail below.

3   Detailed Summary

3.1   Registering for Access Code

Please use the online registration form on the FairScore website to obtain an access code.

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[1]Edward K. Cheng & Scott J. Farmer, A Normalized Scoring Model for Law School Competitions, 17 Green Bag 2d 377 (2013).

3.2 Scoring Template File

Download the template file, **FairScoreInputTemplate.xlsx**, which is an Excel template that you should use to upload your raw scores. Replace the example data in the template with your own. The template consists of six columns:

StudentName — the name of the student (spaces and other special characters allowed)

JudgeName — the name of the judge (spaces and other special characters allowed)

Control1 / Control2 / Control3— up to three "control" variables that might explain some of the scoring. These control variables will often include things like whether the student argued the plaintiff side or the defense side. Please note that you may rename these control variables, e.g., "Petitioner" rather than "Control1", to keep your scoresheet comprehensible. The FairScore system will adjust accordingly.

At this time, FairScore only accepts dichotomous control variables, so the entries under the control variables can only be "1" (yes) or "0" (no). If you do not wish to use one (or all) of the control variables, simply record a "0" for all entries. If you would like to use FairScore with more complicated categorical or numerical control variables, please contact us.

Score — the score given by the judge to the student. The score may be negative if desired.

3.3 Running the Model

After filling out the template, clicking on "Use / Use FairScore" to bring you to the main program page. You will be asked for your access code to log into the program page.

On the main program page, click on "Select Data File" to generate a dialog box in which you can find and select your data file. Click on "Upload" to transfer your data file to the FairScore system. Then click on "Run Model" to execute the normalization program. Note that depending on the file size, execution time can take several minutes.

3.4   Output Files

FairScore will produce a set of output files. The most important of these is:

ResultNormScores.csv — the names of participants and their normalized scores.

Beyond the normalized scores, FairScore produces several files to help with diagnostics post-normalization.

ResultBetas.txt — estimates for the effect of the control variables, such as the side argued, etc., included in the model. Note that these estimates will be nonsense for control variables that were not used.

ResultJudges.csv — propensity scores for the judges, showing which are more generous (more positive values) and which are more stringent (more negative values).

ResultPlot.pdf — a plot (often called a "caterpillar plot") of all of the normalized scores along with their credibility intervals, which express the uncertainty surrounding them.

FairScore also provides several files to give a more detailed picture of the scoring *before* the normalization process.

RawHistJudgeMeans.png — a histogram of the mean score given by each judge prior to the normalization process.

RawHistStudentMeans.png — a histogram of the mean score given to each participant prior to the normalization process.

RawHistScores.png – a histogram of all the scores given during the competition

RawSummary.txt — summary statistical information for all the scores given in the competition, mean judge scores, and mean participant scores.

RawScoresStandardized.csv — a list of all the initial scores standardized to a standard normal curve (i.e., subtract mean and divided by standard deviation)

4 Contributors

Edward K. Cheng is Professor of Law at Vanderbilt Law School, and is also a doctoral candidate in statistics at Columbia University. His scholarship focuses on scientific and expert evidence, and the interaction of law and statistics. He teaches evidence, torts, and a statistics class for lawyers. Ed is also the host of Excited Utterance, a podcast focusing on scholarship in evidence law and proof.

Yaohai (Peter) Xu is a senior at City University of Hong Kong, majoring in Computer Science. Peter spent the Fall 2016 semester at Vanderbilt University's School of Engineering.

Scott J. Farmer is an associate at Simpson Thatcher & Bartlett LLP in New York City. Scott was a member of the Managing Council of the Vanderbilt Moot Court Board in 2012-13, and was in charge of scoring of the 2012 Intramural Moot Court Competition.

Janna Maples is a founding partner of Reist & Maples PLC in Nashville, Tennessee. Janna was Chief Justice of the Vanderbilt Moot Court Board in 2012-13.

5 Sponsor

The FairScore program and website are supported by the Vanderbilt Law School Moot Court Board.

6 Contact

For questions, comments or problems about FairScore, please contact Ed Cheng at edward.cheng@vanderbilt.edu.