Academy Spectral Similarity Index (SSI) Calculator User Guide

2019-03-11

The Academy Spectral Similarity Index (SSI) Calculator is a web-based tool for calculating the SSI value of a test illuminant when compared to a reference illuminant. Unlike most color indices, the SSI does not rely on the spectral sensitivity of human vision or of a particular camera. Instead, it compares how closely a test spectrum matches a reference spectrum; if there is a close match, there is a high confidence factor that the rendered colors using the test source will be close to those that would occur when using the reference source. Because of the comparison, the SSI value always includes in brackets what reference was used to calculate the value.

The spectral data – often called the Spectral Power Distribution (SPD) – is a table that gives the amplitude of the illuminant at each visible wavelength. The SPD is obtained using a spectroradiometer, spectrometer, or from a reliable source that has already done the measurement.

The test spectrum data is copied from an existing file and pasted into the tool in the “Test” column. If the “Reference Spectrum” is left in the “Default” setting, the tool will automatically choose the closest blackbody CCT spectrum for use as the reference illuminant. The resulting SSI value will be shown in the “Results” area. An example of this is shown in Figure 1.

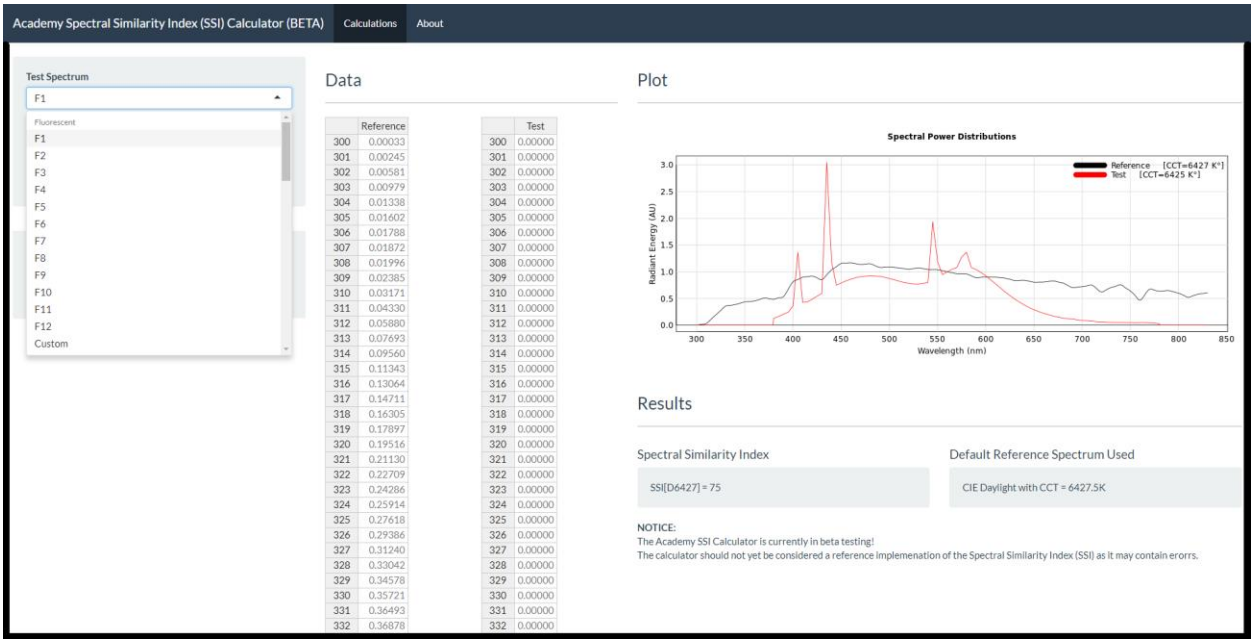

Figure 1. Default Reference Spectrum Screen.

If “Daylight” is chosen as the Reference Spectrum, several of CIE standard daylight illuminants are available for use as the reference as shown in Figure 2. In general, the Reference Spectrum selection should be the type of daylight that is being imitated by the test source; this will typically be indicated by the manufacturer of the luminaire. Conversely, it is possible to select “CCT” and manually enter the blackbody CCT to be used as the Reference Spectrum. The intent is to use commonly-used CCT values as reference illuminants as opposed to arbitrary values – users of the tool will probably be looking for a luminaire that can be used as a substitute for another standard luminaire, or one that will match another luminaire.

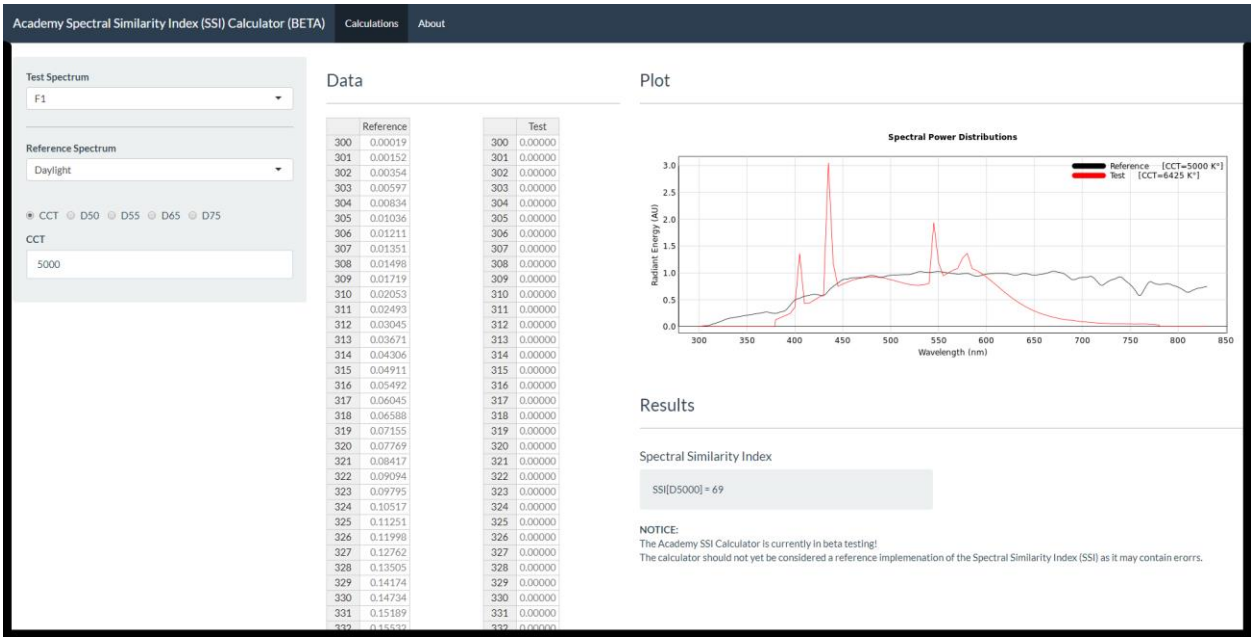

Figure 2. Daylight Reference Spectrum Screen.

If “Blackbody” is chosen as the Reference Spectrum, then it is possible to manually add the blackbody color temperature into the CCT setting as shown in Figure 3. Normally, this should be a commonly used reference value – e.g., 2700K for home lighting, 3200K for cinema lighting. Conversely, by selecting the “A” setting the tool will automatically select the CCT that will give the highest SSI score. (This is normally for informational purposes.) An example of this operation is shown in Figure 4.

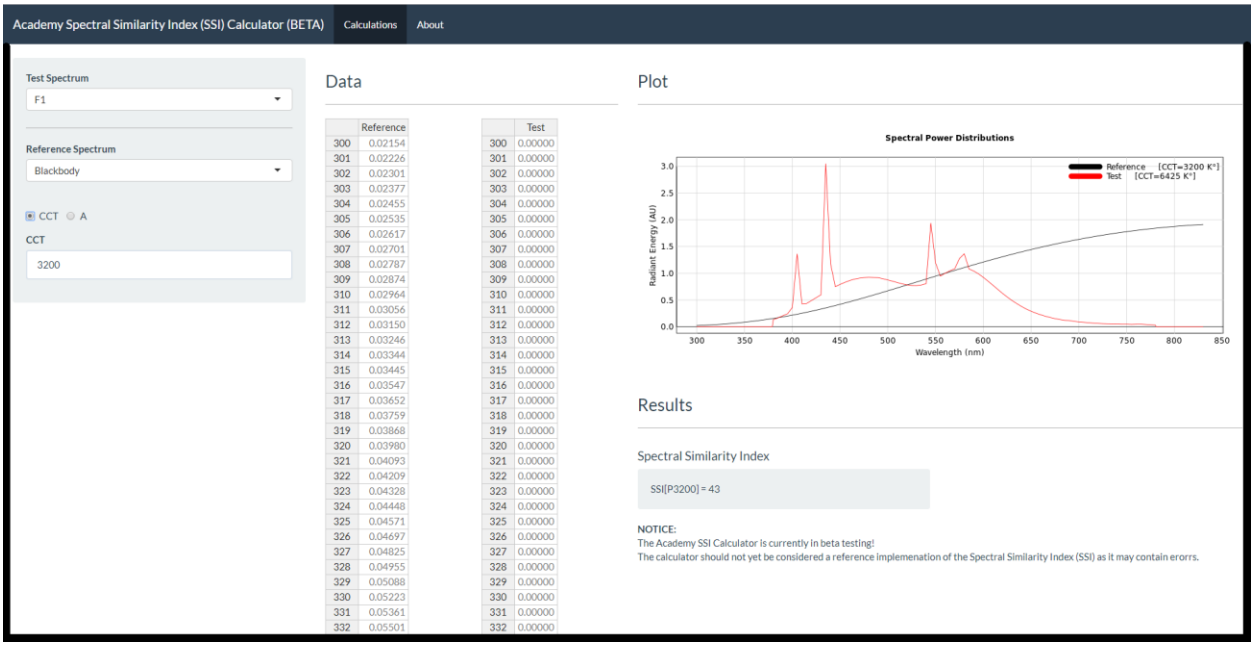

Figure 3. Blackbody Reference Spectrum Screen.

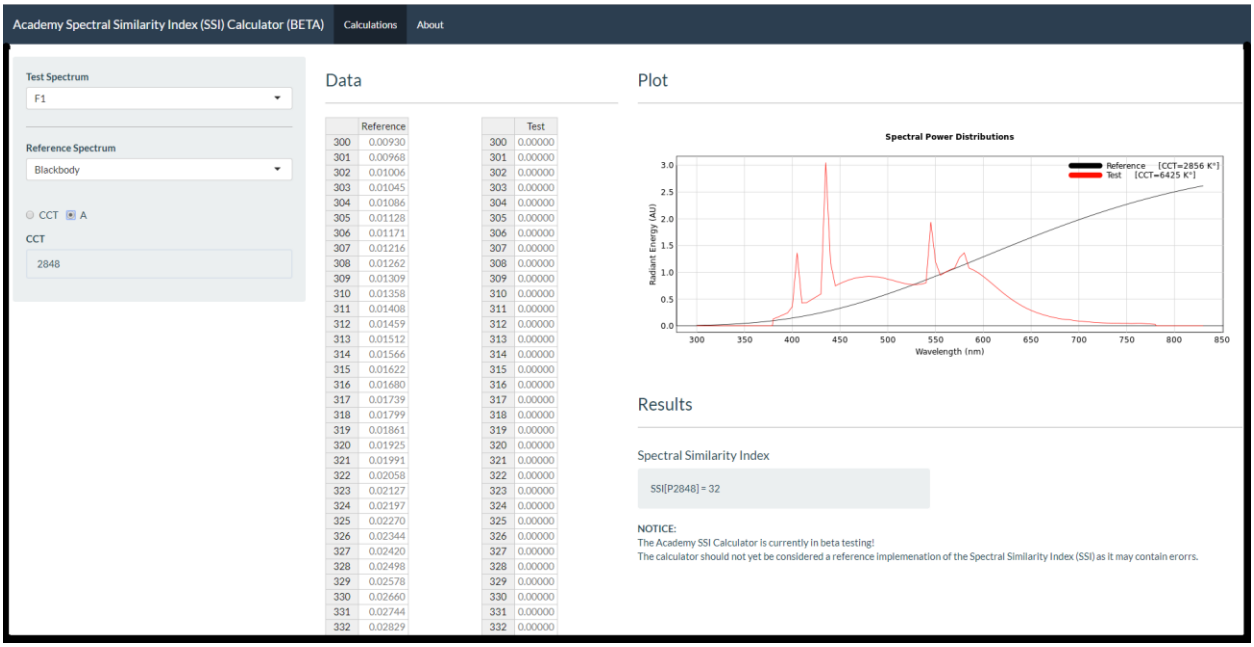

Figure 4. Blackbody A Reference Spectrum Screen.

If the user has SPD values that are at a different wavelength spacing and range than the default used in the tool, it is possible to select a “Custom” Test Spectrum and then define the minimum wavelength, maximum wavelength, and the wavelength increments of the SPD data as shown in Figure 5. For example, if the measured SPD data is from 380nm to 680nm at 2nm increments, then by entering those values the Test Spectrum table will be reformatted to match those settings. It is then easy to copy and paste the data from the existing SPD file.

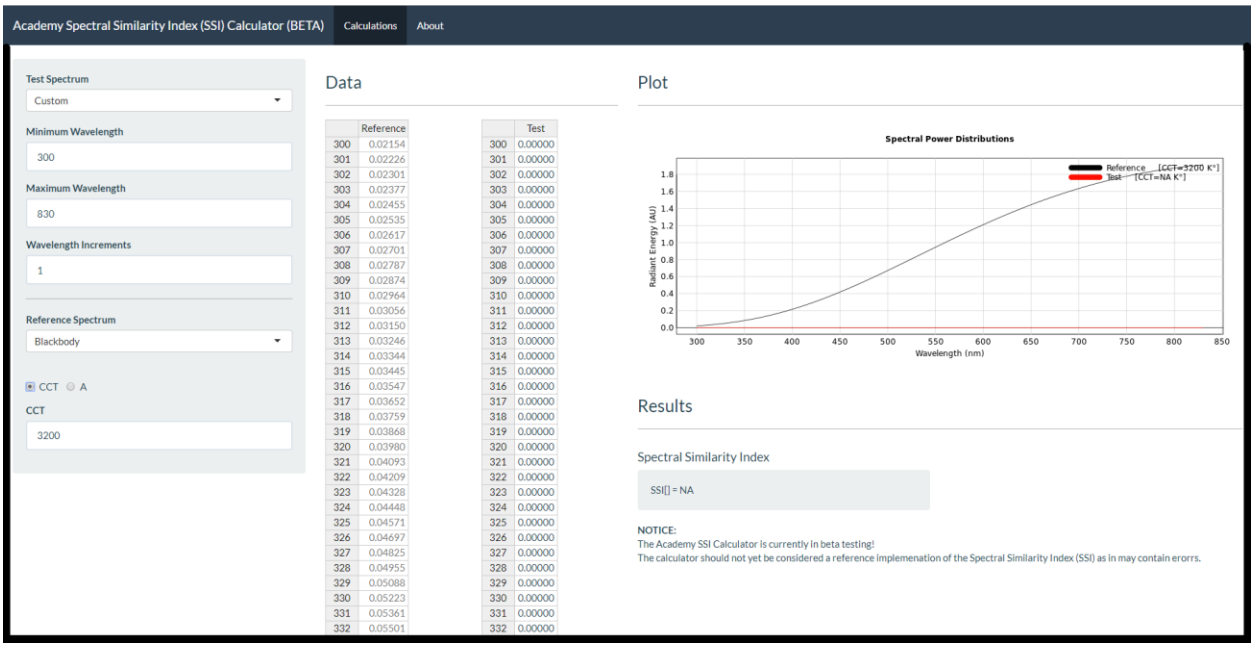

Figure 5. Custom Test Spectrum Screen.

About the Academy SSI Calculator (BETA)

Introduction

The Academy Spectral Similarity Index (SSI) Calculator has been written and is maintained by the Academy of Motion Picture Arts and Sciences. This tool implements the Academy Spectral Similarity Index (SSI) and is intended to be compliant with the SSI specification.

Source code can be found on Github.

For more information on the Academy Spectral Similarity Index please visit: http://www.oscars.org/ssi.

Software

This calculator was built using R, Shiny, Shiny Server Open Source and colorSpec.
Current software versions :

- R version 3.5.2 (2018-12-20)
- Shiny 1.2.0
- Shiny Server v1.5.6.875
- colorSpec 0.7.4.1

The calculator source code was last updated on 2019-02-06 11:19:00 -0800.
The git commit id of the current calculator code is de8370c.

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