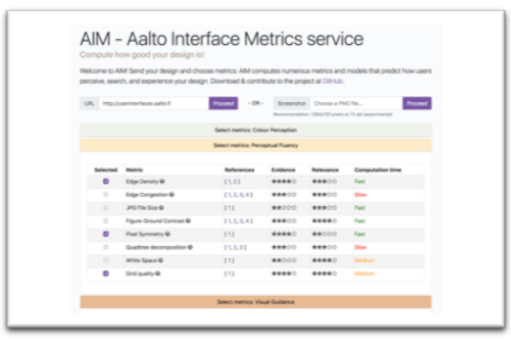
Aalto University

User Interfaces
Aalto University

Contact
Publication
Project
GitHub



CHOOSE METRICS

PAGE PREVIEW

RESULTS

AIM - Aalto Interface Metrics service

Compute how good your design is!

Welcome to AIM! Send your design and choose metrics: AIM computes numerous metrics and models that predict how users perceive, search, and experience your design. Download & contribute to the project at GitHub.

Summary

- Standard Deviation Lightness — Medium
- Mean A (Green-Red Space)
- Standard Deviation A
- Mean B (Yellow-Blue Space)
- Standard Deviation B

Hassler-Susstrunk Colourfulness

- Mean Distribution (Red-Green)
- Standard Deviation Distribution (Red-Green)
- Mean Distribution (Yellow-Blue)
- Standard Deviation Distribution (Yellow-Blue)
- Mean Distribution (RGYB)
- Standard Deviation Distribution (RGYB)
- Colourfulness — Less colourful

Static Colour Clustering

- Number of Clusters — Less colourful

Dynamic Colour Clusters

- Number of Clusters — Less colourful
- Average Number of Colours per Cluster

Luminance: Standard Deviation

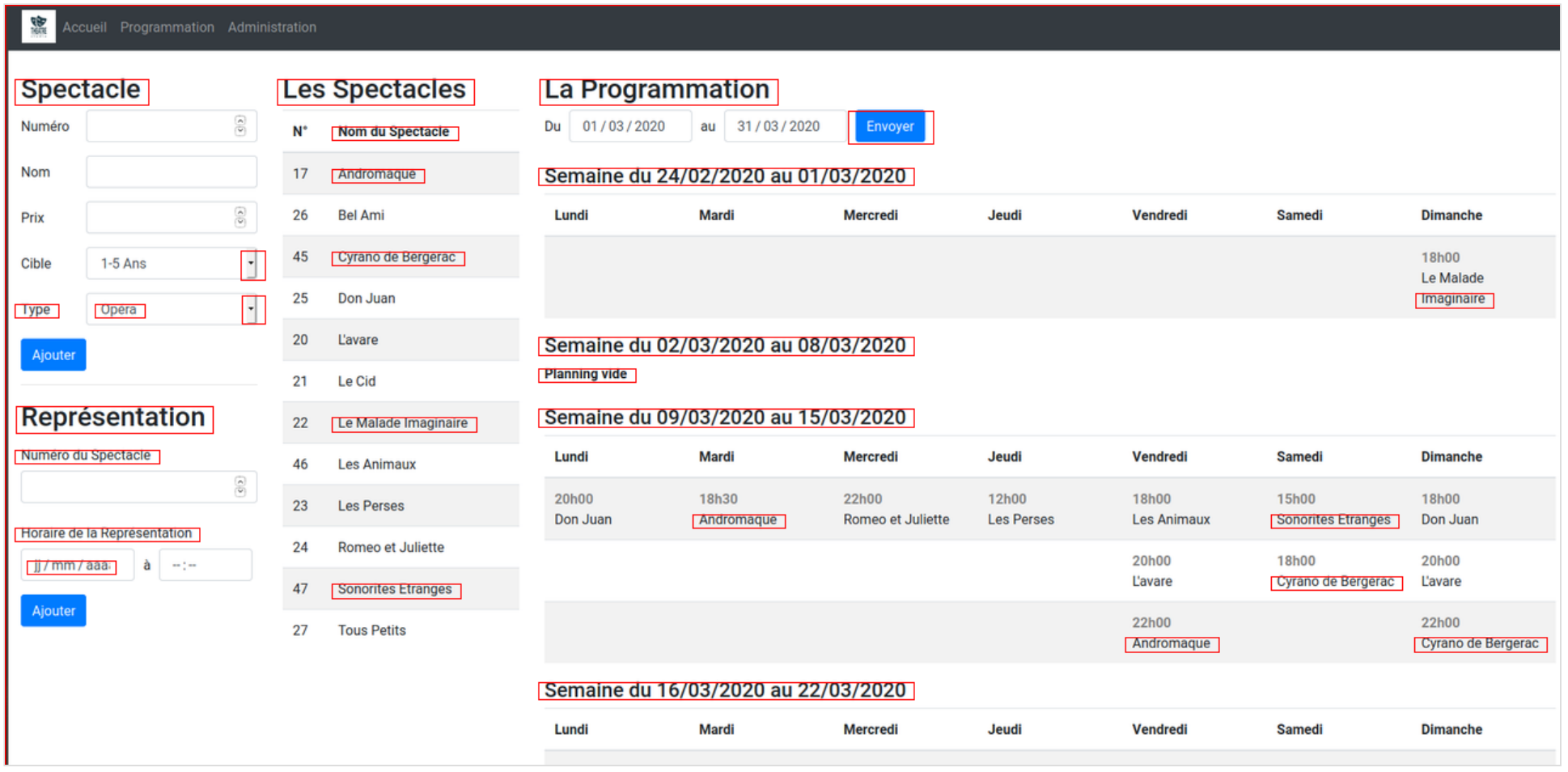
- Standard Deviation in Luminance — Good

WAVE (Weighted Affective Valence Estimates)

- Average WAVE Score Across Pixels — Low

Preview

1280 x 800 pixels at 72 dpi (URL) or original image resized to 1280 pixels width at 72 dpi (screenshot)



Results

Colour Perception

Unique RGB Colours

The number of unique colours in RGB spectrum is an indication of colour variance. Colours that occur more than a threshold value are counted. Note that this is confounded by image size

References: [1, 2]

Evidence: ★★☆☆☆
Relevance: ★★☆☆☆

Result	Value	Evaluation	Show Details
Number of Colours	1063	Less colourful	Show Details

HSV Colours: Average and STD

The HSV (Hue, Saturation, Value) colour space aligns more closely with the human visual system. These metrics report average and standard deviation for each channel in HSV. Empirical research has shown hue and saturation channels to correlated with aesthetic impression.

References: [1]

Evidence: ★★★☆☆
Relevance: ★★☆☆☆

Result	Value	Evaluation	Show Details
Average Hue	356.99	-	Show Details
Average Saturation	0.02	Low ⚠	Show Details
Standard Deviation of Saturation	0.09	Low ⚠	Show Details

Result	Value	Evaluation	Show Details
Average Value	0.92	Light	Show Details
Standard Deviation of Value	0.20	Medium	Show Details

Number of Unique Colours in the HSV Spectrum

The HSV (Hue, Saturation, Value) colour space aligns more closely with the human visual system. This metric reports the number of unique colours per channel in HSV. Unlike the other HSV metric, no direct empirical evidence exists for this metric. Note that the metric correlates highly with the number of colours in the RGB space.

References: [1]

Evidence: ★★☆☆☆
Relevance: ★★☆☆☆

Result	Value	Evaluation	Show Details
Number of Unique HSV	2130	Good	Show Details
Number of Unique Hue	5122	-	Show Details
Number of Unique Saturation	7117	-	Show Details
Number of Unique Value	256	-	Show Details

LAB Colours

The LAB colour space approximates human vision for uniformity of colour perception. Results sre similar to the HSV metric. Empirical work has provided support for correlation between SD in luminance and aesthetic impression.

References: [1]

Evidence: ★★★☆☆
Relevance: ★★☆☆☆

Result	Value	Evaluation	Show Details
Mean Lightness	91.76	Light	Show Details
Standard Deviation Lightness	20.66	Medium	Show Details
Mean A (Green-Red Space)	0.05	-	Show Details
Standard Deviation A	1.65	-	Show Details
Mean B (Yellow-Blue Space)	-0.67	-	Show Details
Standard Deviation B	5.23	-	Show Details

Hassler-Susstrunk Colourfulness

The Hassler-Susstrunk metric is computed based on the RGYB colour spectrum and mainly comprises standard deviations. The higher the deviation, the more colourful the image is perceived. This has a high correlation with aesthetic impression, but has been mainly tested with photography not user interfaces. The metric is, however, computationally expensive. Note that this metric does

not take hue into account.

References: [1]

Evidence: ★★★★☆
Relevance: ★★★☆☆

Result	Value	Evaluation	Show Details
Mean Distribution (Red-Green)	1.32	-	Show Details
Standard Deviation Distribution (Red-Green)	8.42	-	Show Details
Mean Distribution (Yellow-Blue)	2.19	-	Show Details
Standard Deviation Distribution (Yellow-Blue)	13.10	-	Show Details
Mean Distribution (RGYB)	2.56	-	Show Details
Standard Deviation Distribution (RGYB)	15.57	-	Show Details
Colourfulness	16.34	Less colourful	Show Details

Static Colour Clustering

Static colour clusters refers to the number of pre-determined colour clusters in the image. Clustering is based on slicing of RGB channels. It indicates the number of dominant colours but is confounded by colour variance. Dynamic colour clusters has higher correlation with aesthetic impression, but it is also more complex to compute.

References: [1, 2]

Evidence: ★★☆☆☆
Relevance: ★★★☆☆

Result	Value	Evaluation	Show Details
Number of Clusters	868	Less colourful	Show Details

Dynamic Colour Clusters

Indicates the number of colour clusters in an image and the average number of colours within each cluster. Colours are clustered recursively, using as criteria their distance in a colour cube. Only clusters with more than 5 values are included in the final count. The number of colours per cluster is shown to correlate with aesthetic perception. Indicates the number of colour clusters in an image and the average number of colours within each cluster. Colours are clustered recursively, using as criteria their distance in a colour cube. Only clusters with more than 5 values are included in the final count. The number of colours per cluster is shown to correlate with aesthetic perception.

References: [1, 2]

Evidence: ★★★☆☆
Relevance: ★★★☆☆

Result	Value	Evaluation	Show Details
Number of Clusters	112	Less colourful	Show Details
Average Number of Colours per Cluster	11	-	Show Details

Luminance: Standard Deviation

Standard deviation of luminance indicates how much luminance varies across the image. It has no or low correlation with perceived colour variability, but some correlation with aesthetic impression. Note that this implementation does not account for display-dependent gamma corrections (rec. 709 standard).

References: [1]

Evidence: ★★★☆☆
Relevance: ★★★☆☆

Result	Value	Evaluation	Show Details
Standard Deviation in Luminance	54.13	Good ✓	Show Details

WAVE (Weighted Affective Valence Estimates)

This takes the mean colour preference score of each pixel, based on empirically-obtained colour preference scores. These colour preference scores were retrieved by asking participants to rate their preferences for objects of these colours, with the theory that the preferences for these objects translate directly to preferences for the colours of these objects.

References: [1]

Evidence: ★★★☆☆
Relevance: ★★☆☆☆

Result	Value	Evaluation	Show Details
Average WAVE Score Across Pixels	0.49	Low ⚠	Show Details

Perceptual Fluency

Edge Density

Edge density correlates with perception of clutter. It is computed as the ratio of pixels that align with an edge as compared to the total number of pixels in the image. Note that this metric does not take colour variance into account, unlike e.g. the feature congestion metric.

References: [1, 2]

Evidence: ★★★★☆
Relevance: ★★★☆☆

Result	Value	Evaluation	Show Details
Edge Density ?	0.09	Good ✓	Show Details

Edge Congestion

Edge congestion indicates the ease with which main edges can he perceived. A crowded image is hard to follow. The edge congestion indicator is important for complex interfaces and graph visualizations.

References: [1, 2, 3, 4]

Evidence: ★★★☆☆
Relevance: ★★★☆☆

Result	Value	Evaluation	Show Details
Edge Congestion	0.50	Fair	Show Details

Figure-Ground Contrast

Luminance and colour contrast correlates with perceptual fluency. Words and objects with high contrast are easier to read and detect.

References: [1, 2, 3, 4]

Evidence: ★★★☆☆
Relevance: ★★★★☆

Result	Value	Evaluation	Show Details
Figure-Ground Contrast	1.07	-	Show Details

Pixel Symmetry

Pixel symmetry indicates perceived symmetricity across an axis. It is associated with the Gestalt principle of symmetry. This metric considers the whole image and finds an axis for maximum symmetry. The metric may be more apt for drawings and photos than user interfaces where elements are unique.

References: [1]

Evidence: ★★★★☆
Relevance: ★★☆☆☆

Result	Value	Evaluation	Show Details
Normalized Symmetry	0.28	Good	Show Details

Quadtree Decomposition

Quadtree decomposition indicates visual complexity of a scene. It recursively breaks down the image into regions based on entropy in colour and luminance channels.

References: [1, 2, 3]

Evidence: ★★★☆☆
Relevance: ★★★☆☆

Result	Value	Evaluation	Show Details
Balance	0.23	Potential unbalanced	Show Details
Symmetry	0.49	Poor	Show Details
Equilibrium	1.00	Centralized	Show Details
Number of Leaves	451	Good	Show Details

White Space

The proportion of white space indicates, on one hand, effective use of space and, on the other, ability of the interface to guide

attention to regions on the user interface. This metric is a heuristic and not based on a theory of human visual system

References: [1]

Evidence: ★★☆☆☆
Relevance: ★★★★☆

Result	Value	Evaluation	Show Details
White Space	-0.06		Show Details

Grid Quality

Grid quality indicates the internal alignment of the various components or identifiable regions of the UI with respect to each other. Several studies have established that the grid quality has a strong impact on the aesthetic impression induced by the overall layout. Specifically, the measures "G2 and G5" (pp. 1166,Table 3) have been adapted for the evaluation of grid layouts within web pages.

References: [1]

Evidence: ★★★★☆
Relevance: ★★★★☆

Result	Value	Evaluation	Show Details
Number of Alignment Lines	89	Low ⚠	Show Details

Visual Guidance

Saliency

Saliency refers to visual conspicuity of regions on the interface. It predicts which areas attract attention when seeing the interface for the first time or when searching for information.

References: [1]

Evidence: ★★★★★
Relevance: ★★★★☆

Saliency

An overview of the most salient places on the interface.

Visual Search Performance (experimental)

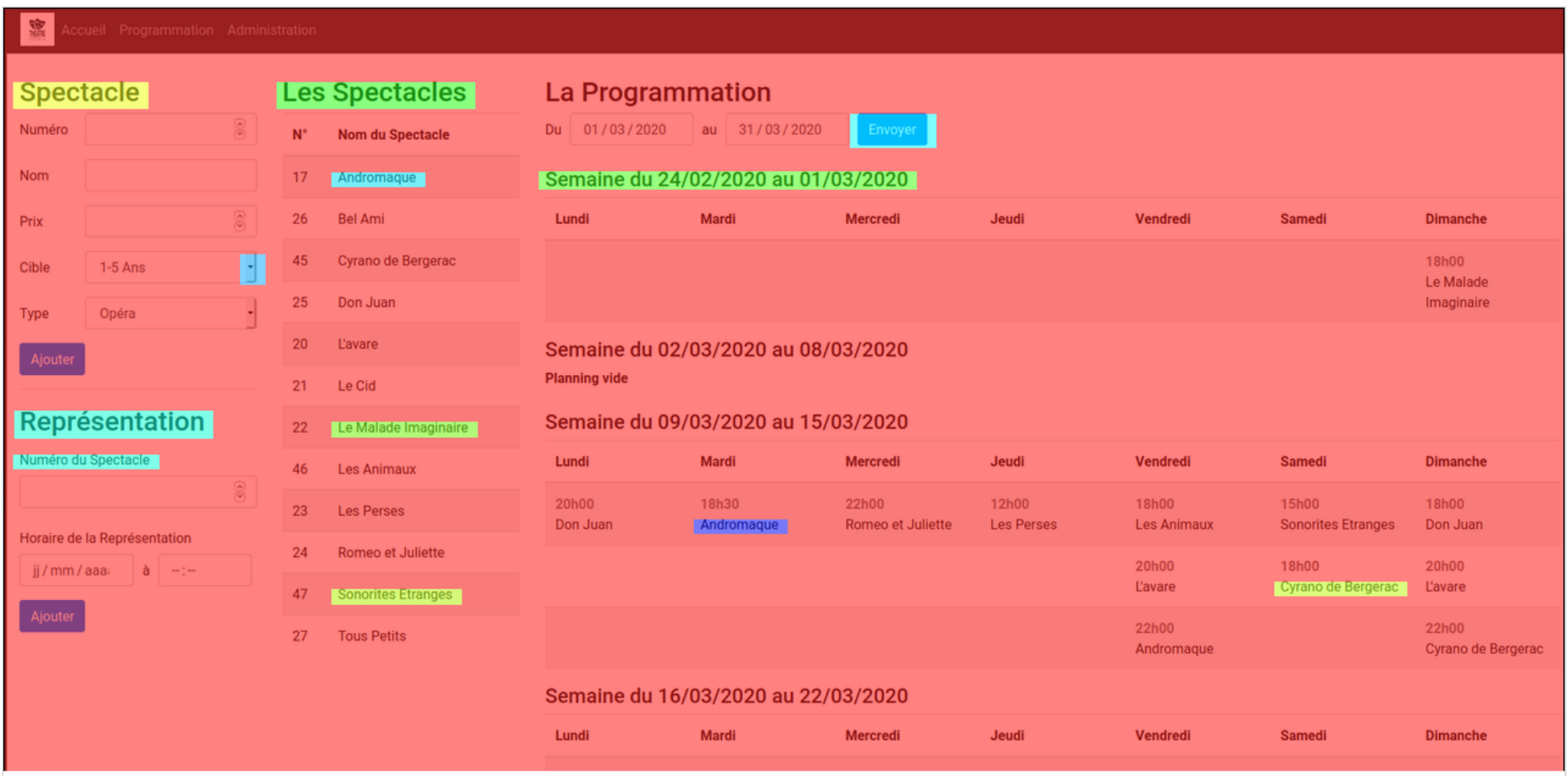
Visual search performance indicates the ease with which different elements can be found from the image after some experience with the layout.

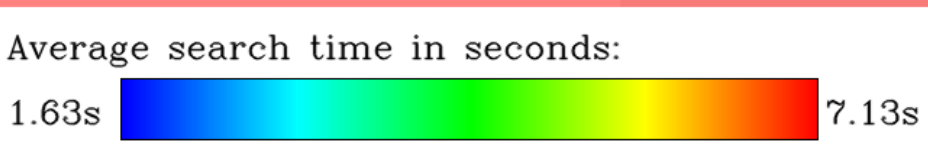
References: [1]

Evidence: ★★★★☆
Relevance: ★★★★★

Search Speed

Average search time of page elements.





Accessibility

Colour Blindness

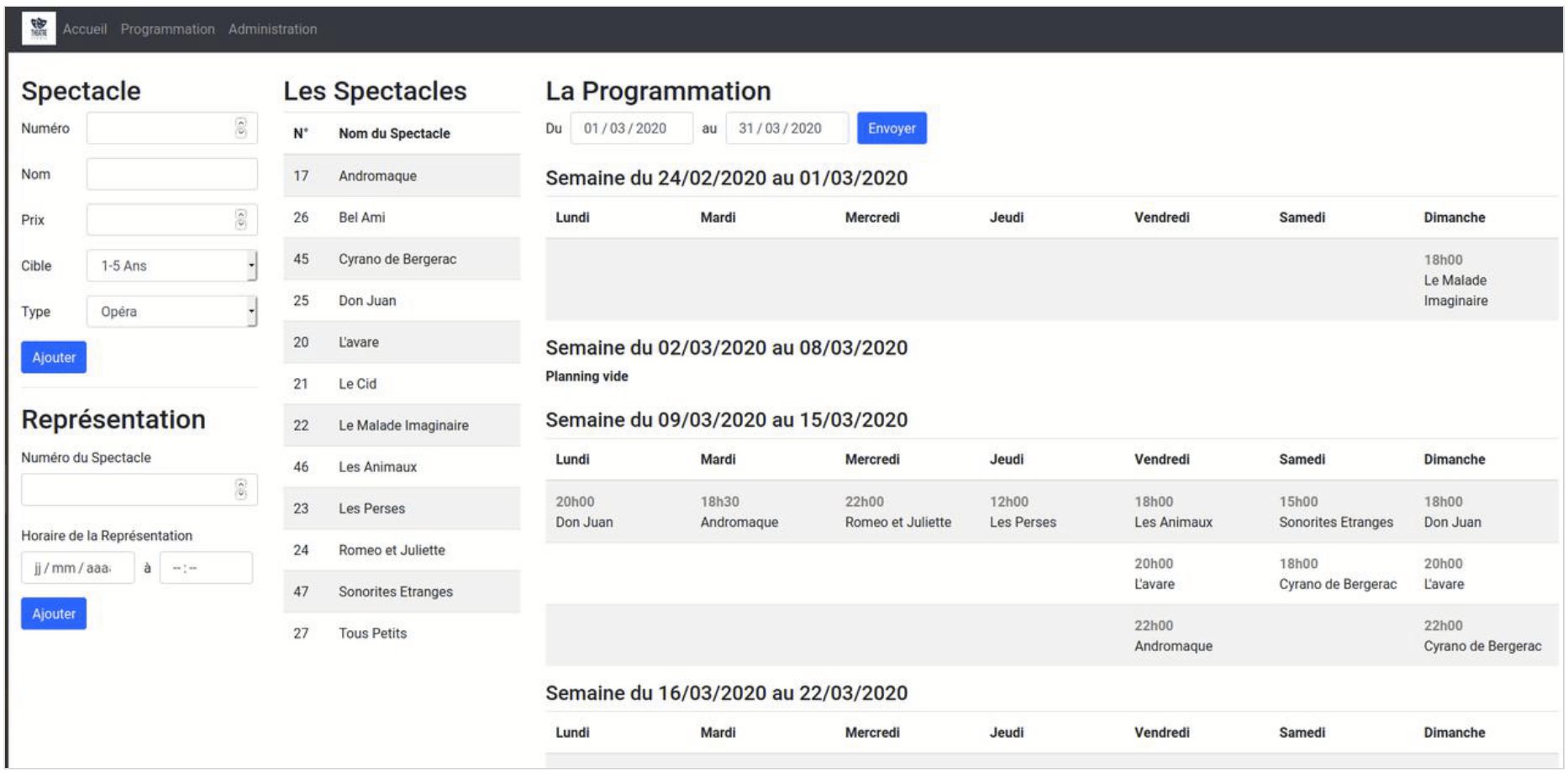
These metrics indicate information loss for users with colour vision deficiencies. The metrics are physiologically motivated and currently handle anomalous trichromacy and dichromacy. Evidence for the metric come from controlled experiments.

References: [1]

Evidence: ★★★★☆
Relevance: ★★★★★

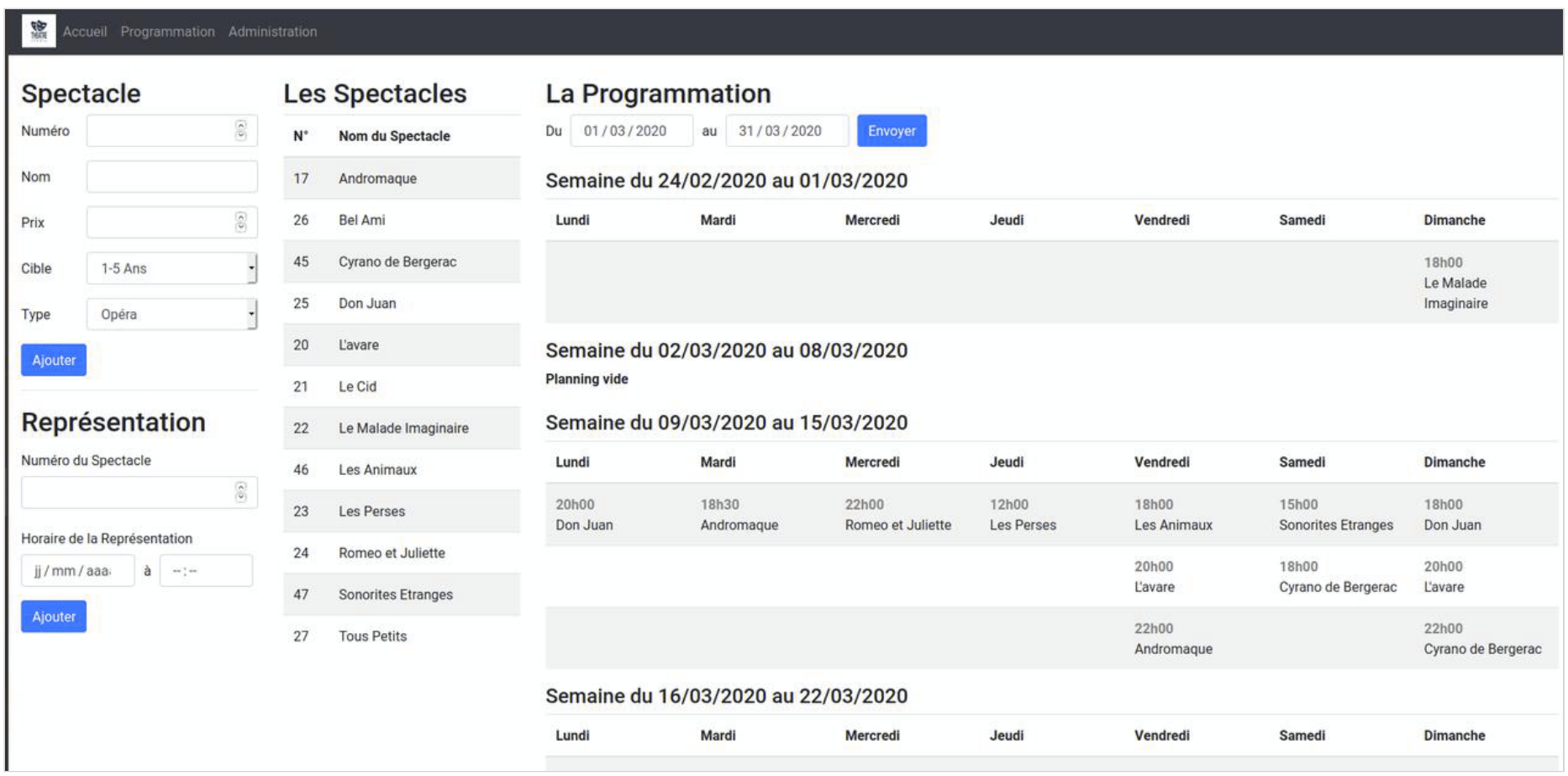
Deuteranopia

Red-green colour blindness, lacking red cones.



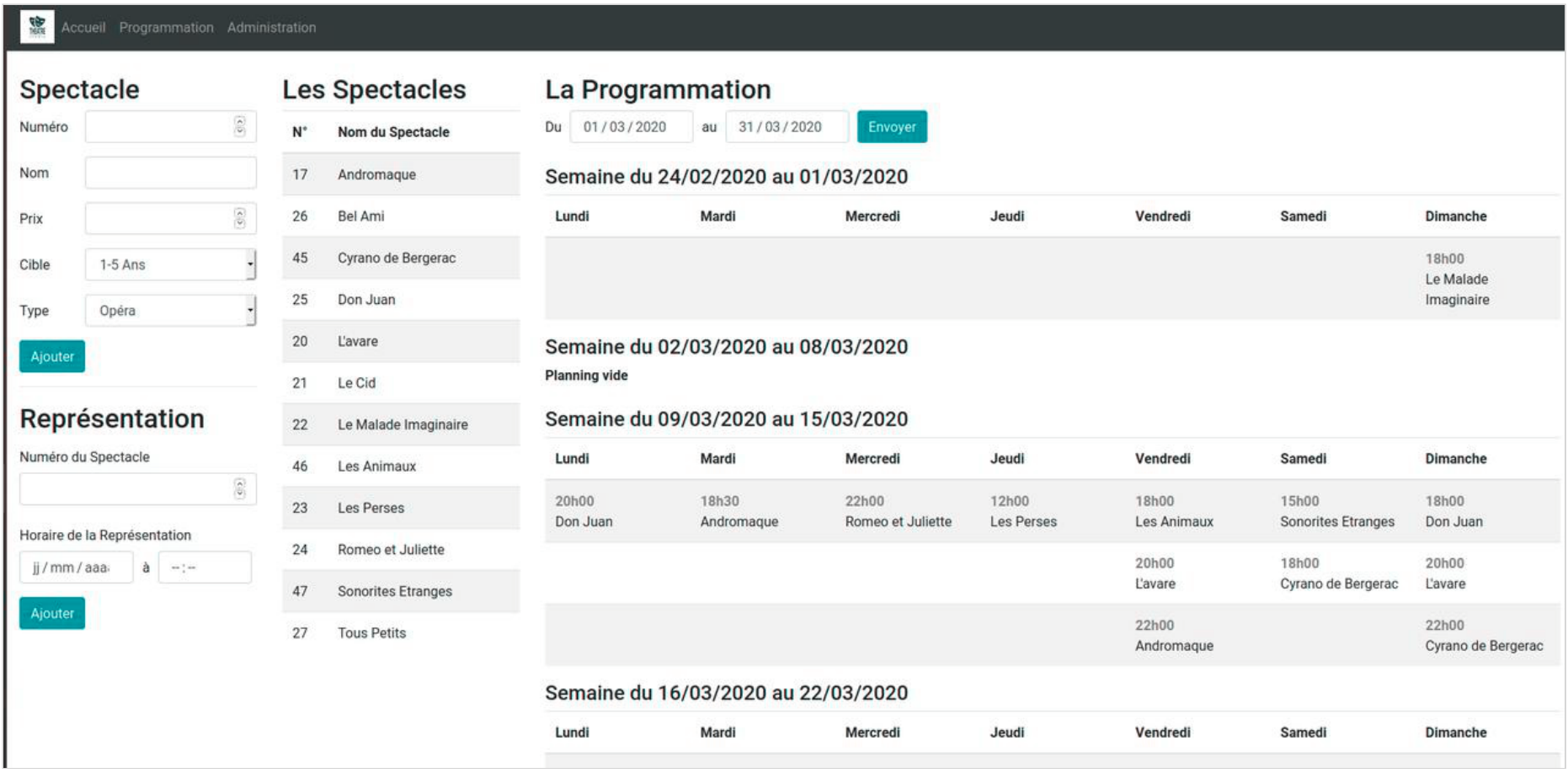
Protanopia

Red-green colour blindness, lacking green cones.



Tritanopia

Blue-yellow colour blindness.



Restart