

What makes the perfect Eurovision entry?

CS5044 : P2 : Group 29

Group Member 1: 210003236

Group Member 2: 240032516

Group Member 3: 240011773

Word Count: 1007

1 DATA & QUESTIONS

- **Dataset:** Eurovision Song Contest finals (1998–2012).
- **Source:** Retrieved from public Tableau sample data; original Excel converted to CSV [5].

This includes two CVS files:

1. eurovision_1998_to_2012 [1](#).
2. eurovision_1998_to_2010_voting [2](#).

- **Data points:** 648 individual final performances (rows).
- **Visual analysis question:** *What makes the perfect Eurovision entry?*
- **Supporting visual-analysis tasks and insights:**
 - Identify which song and performance features (e.g., language, running order, genre) correlate with high total points.
 - Extension of this: examine trends over time to detect evolving preferences in “perfect” entries.
 - Illustrate how countries rank each other, is there a political bias?
 - Is there a gender bias?

Attribute Mapping and Encoding

2 DESCRIPTION OF THE VISUALISATION

Our dashboard is a linked, multi-view D3.js application that answers “What makes the perfect Eurovision entry?” by combining a choropleth map, dot plot, line chart, treemap and correlation matrix. Users get an overview of all years, can filter by year or feature,

Choropleth Map

- **Encoding:** Countries coloured by total Normalized_Points (colour hue, sequential scale).
- **Interaction:**

Table 1: eurovision_meta Attribute Mapping and Encoding

| Attribute | Original Type | Description | Mapping | Encoding |
|-------------------|---------------|---|-----------|----------------|
| Year | Integer | Contest year | None | Numeric |
| Country | Categorical | Performing country | Label map | String |
| Region | Categorical | Broad region | Label map | String |
| Artist | String | Artist name | None | — |
| Song | String | Song title | None | — |
| Artist.gender | Categorical | Gender of artist | Label map | String |
| Group.Solo | Categorical | Solo vs. group | Label map | Binary (0/1) |
| Semi.Final.Number | Numeric | Semi-final round number | None | Numeric |
| Is.Final | Binary (0/1) | Final qualifier flag | None | Numeric |
| Song.In.English | Binary (0/1) | English lyrics flag | None | Numeric |
| Place | Ordinal | Final ranking | None | Numeric |
| Points | Integer | Total points received | None | Numeric |
| Home.Away.Country | Categorical | Home vs. away by country | Label map | Binary (0/1) |
| Home.Away.Region | Categorical | Home vs. away by region | Label map | Binary (0/1) |
| Normalized.Points | Numeric | Year-normalized points | None | Numeric |
| Song.Quality | Numeric | Expert rating (0–1) | None | Numeric |
| Duration | Numeric | Song length (seconds) | None | Numeric |
| Acousticness | Numeric | Echonest acousticness score | None | Numeric |
| Danceability | Numeric | Echonest danceability score | None | Numeric |
| Energy | Numeric | Echonest energy score | None | Numeric |
| Speechiness | Numeric | Echonest speechiness score | None | Numeric |
| Liveness | Numeric | Echonest liveness score | None | Numeric |
| Loudness | Numeric | Echonest loudness | None | Numeric |
| Valence | Numeric | Echonest valence | None | Numeric |
| Tempo | Numeric | Echonest tempo | None | Numeric |
| Key | Numeric | Echonest key (0–11) | None | To Musical Key |
| Mode | Numeric | Echonest mode (major/minor) | None | Boolean |
| Time Signature | Numeric | Echonest time signature (beats per bar) | None | Numeric |
| Happiness | Numeric | Lyrics-based happiness score (0–1) | None | Numeric |

Table 2: Voting Final Attribute Mapping and Encoding

| Attribute | Original Type | Description | Mapping | Encoding |
|-----------|---------------|---------------------|-----------|----------|
| Year | Integer | Contest year | None | Numeric |
| Country | Categorical | Receiving country | Label map | String |
| Giver | Categorical | Awarding country | Label map | String |
| Score | Integer | Points given (0–12) | None | Numeric |

- *Year slider* (overview → filter) re-sets map to a single year or “All.” [2](#).
- *Hover* displays a tooltip with country name and aggregated points (details-on-demand [\[4\]](#)).
- *Click* selects a country, triggering display of that country’s voting flows in other views [1](#).



Figure 1: Voting Flow ; Chloropleth Map

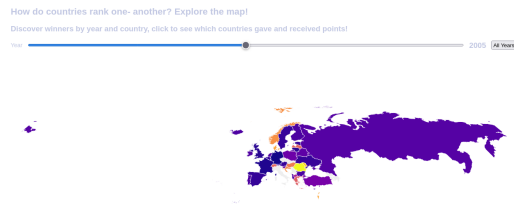


Figure 2: Timeline example ; Chloropleth Map

Dot Plot

- **Encoding:** Circles represent artists; x-axis = gender category; y-axis = total normalised points; radius = number of appearances (Fig. 3).
- **Interaction:** Hover tooltip shows Artist, Country, Total Points, Appearances and Years.

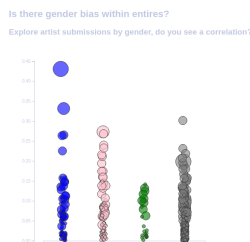


Figure 3: Dot Plot Example

Line Chart & Linked Radar Chart

- **Encoding:**
 - *Line Chart:* X-axis = Year; Y-axis = mean feature value; multi-line (all features)(Fig. 4). or single blue line + dots (Fig. 5).
 - *Radar Chart:* radial axes = FEATURES 7; polygon = normalised feature values of the clicked winner (Fig. 6).
- **Interaction:**
 - *Dropdown* selects “All Features” vs. a specific feature.
 - *Hover* on a dot displays Year and mean value.
 - *Click* on a dot renders the radar chart for that year’s winning song.

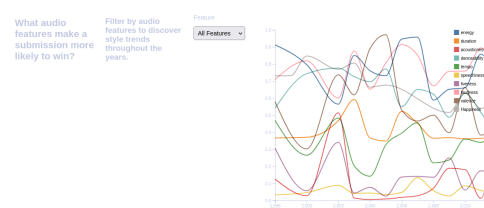


Figure 4: Line Chart: All Features Selected

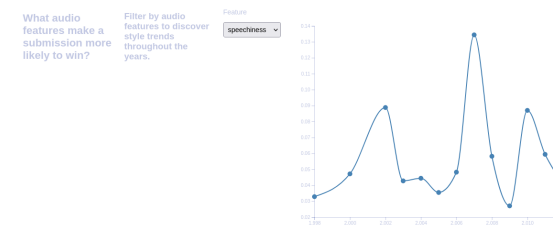


Figure 5: Line Chart ; One Feature Elected

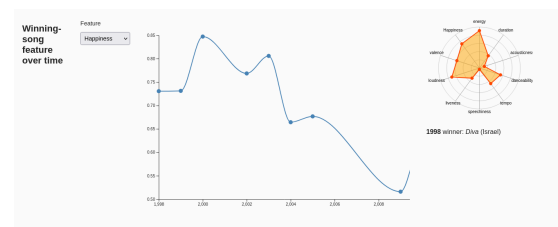


Figure 6: Radar and Line-map Linked view



Figure 7: Radar Map View

Treemap

- **Encoding:**
 - Tiles represent rank buckets (1–5, 6–10, 11–15, 16–20, Rest).
 - Area, number of songs in each bucket.
 - Fill colour = dominant mean audio feature for that bucket (Fig. 8).
- **Interaction:**
 - *Hover* reveals bucket range, dominant feature, and count of songs

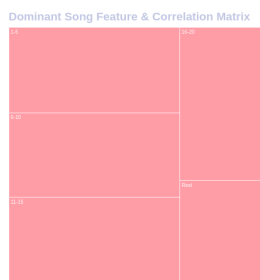


Figure 8: Treemap

Correlation Matrix & Linked Violin Plot

- **Correlation Matrix:**
 - Cells form an $n \times n$ grid of numeric variables
 - Colour (RdBu) = Pearson r (Fig. 8)
 - *Hover* shows “var1 vs var2: r = value”
- **Violin Plot (on-click):**
 - Two side-by-side density shapes for the clicked pair
 - X-axis = feature names, Y-axis = feature value, width = density (Fig. 9)
 - Automatically rendered when you click an off-diagonal cell in the matrix

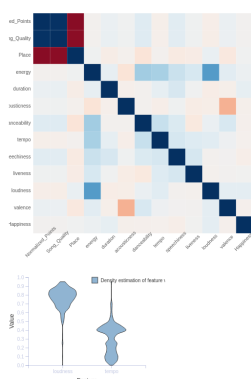


Figure 9: Matrix and Violin Plot

Linked Interaction & Read–Operate–Explore Flow

All views—including the map, dot plot, line chart, treemap, correlation matrix—and the Radar Chart panel share a global tooltip and respond to three primary controls:

1. **Year Slider:** Filters every view to the selected year or resets to all years (overview → filter).
2. **Country Click:** On the map, locks in a country selection, highlighting its data across all views (details-on-demand).
3. **Dot/Line Click:** In the dot plot or line chart, clicking a circle (a winning performance) renders the Radar Chart of its audio features in the detail pane (drill-down).

This coordinated-views design follows Shneiderman’s mantra (*overview first; zoom and filter; details on demand*) to help users iteratively refine their exploration.

Users read the dashboard by first observing overall distributions (map or dot plot), then filtering by year or feature (slider, dropdown), and finally drilling into specific performances via click to view the Radar Chart. Each visual variable (position, size, color, shape) was chosen for expressiveness and effectiveness in mapping data attributes, following Munzner’s marks and channels framework [3].

3 IMPLEMENTATION

HTML5 for structure, CSS3 (Flexbox/Grid) for layout and styling, and ES6 JavaScript modules for logic. All visualisations leverage D3.js (v6) for data binding, scales, axes, shapes and SVG rendering:

- `dotPlot.js`, `lineChart.js`, `treemap.js`, `corrMatrix.js`, `violin.js` handle individual chart types.
- `utils.js` provides shared constants (FEATURES), tooltip helpers[2], and colour scales.
- `radar.js` (formerly used for winner profiles) was adapted from the D3 Radar Chart gallery[1].

Data is preprocessed in JavaScript using D3’s `rollup`, `mean`, `bin` and `treemap` utilities.

All code is organized into modular ES6 files, bundled with a simple build step (e.g. Rollup or Webpack), and served via a static HTTP server. Styling is scoped in `main.css`,

with responsive SVG sizing using `viewBox` and `preserveAspectRatio`.

4 INSIGHTS & DISCUSSION

Key Insights & Exploration Pathways

- **Stand-out One-time Champions.** In the *Dot Plot*, small circles high on the Y-axis (total points) immediately flag artists like Loreen and Ruslana who won decisively in a single appearance. Hover over each to confirm points and year.
- **Gender vs. Success Patterns.** By comparing the distribution of circles across the Male/Female/Both bins on the *Dot Plot*, users can see whether one gender category tends to score higher on average—simply glance at the median Y-position per bin or hover for exact totals.
- **Evolving Audio Characteristics.** In the *Line Chart*, switch to “All Features” to see relative slopes of danceability, valence, energy, etc., then select a single feature to inspect its year-to-year trajectory via dots and tooltips—revealing, for example, a steady rise in danceability among winners.
- **Rank-Bucket Feature Dominance.** The *Treemap* groups songs by final ranking (1–5, 6–10, ...). Tile color indicates the feature with the highest mean in each bucket (e.g. “energy” dominates the 1–5 group), surfaced with a single glance.
- **Bivariate Relationships.** Hover over any cell in the *Correlation Matrix* to read Pearson r . Click an off-diagonal cell and the *Violin Plot* appears, letting users compare the full distributions of those two features side by side.

Limitations & Potential Improvements

- **Overplotting & Clutter.** • *Dot Plot*: many overlapping circles in mid-range obscure repeats. • *Line Chart*: showing all features at once can be visually busy. *Remedy*: add filtering or brushing, or animate one feature at a time.

- **Label Legibility.** Axis labels in the *Correlation Matrix* and *Line Chart* rotate and may overlap on narrow screens. *Remedy*: implement dynamic label wrapping or tooltip-only labels on hover.
- **Treemap Granularity.** Coarse buckets (size 5) hide intra-group variation. *Remedy*: allow users to redefine bucket thresholds or drill down into each tile.
- **Performance & Accessibility.** Colour scales (RdBu, blue) may not be colourblind-safe. In future, we would like to adopt colourblind-friendly palettes, and ensure keyboard navigation for interactive elements.

5 EVIDENCE OF IDEATION PROCESS

The ideation for this project is found in the ideation folder of the root directory.

References

- [1] Mike Bostock. D3 radar chart example. <https://observablehq.com/@d3/radar-chart>, n.d.. Accessed: 2025-04-23.
- [2] Mike Bostock. A tooltip for d3. <https://bost.ocks.org/mike/tooltip/>, n.d.. Accessed: 2025-04-23.
- [3] Tamara Munzner. *Visualization Analysis and Design*. CRC Press, 2014. Chapter 5: Marks and Channels.
- [4] StackCode. Tooltips: An In-Depth Guide to Effective Information Display - StackCode — stack-code.info. <https://stackcode.info/html-projects-with-css/tooltips-an-in-depth-guide-to-effective-information-display> [Accessed 23-04-2025].
- [5] Tableau Public. Eurovision Song Contest Finals Data (1998–2012), 2025. URL https://public.tableau.com/app/sample-data/eurovision_1998%20to%202012.xlsx. 648 data points.