

Radar Data Analysis Dashboard

Visualizing Patterns and Insights

An exploration of radar data using advanced visualization techniques to uncover patterns, relationships, and insights across multiple dimensions.

Radar



Sunburst



Bar



Bubble

Scatter

Data Overview

The radar dataset contains 42,294 records with 9 variables capturing various aspects of radar signals. The data includes spatial coordinates, velocity measurements, and classification labels.

42,294

Records

9

Variables

3

Categories

75

Max Risk Range

Key Variables

 x, y (coordinates)

 velocity

 intensity

 distance

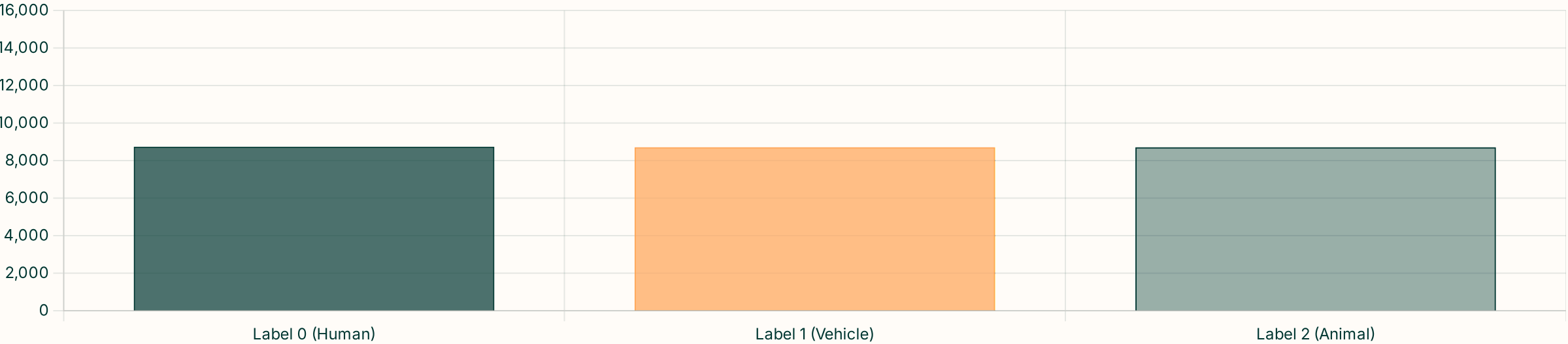
 speed

 angle

 label (0, 1, 2)

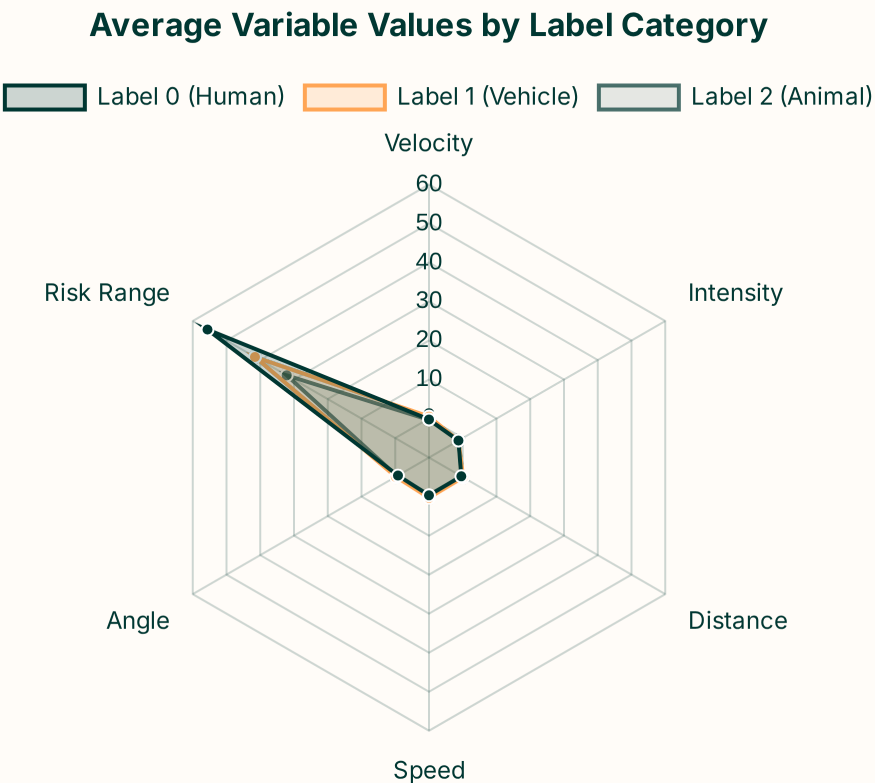
 risk_range

Distribution of Label Categories



Radar Chart Analysis

Radar charts visualize multiple variables simultaneously, revealing patterns across different dimensions. Each axis represents a variable, and each color represents a different label category.



Key Insights

- Label 1 (Vehicle) shows higher velocity and speed values.
- Label 0 (Human) has moderate values with higher risk range.
- Label 2 (Animal) exhibits distinctive intensity patterns.
- Distance variable shows notable variation across categories.

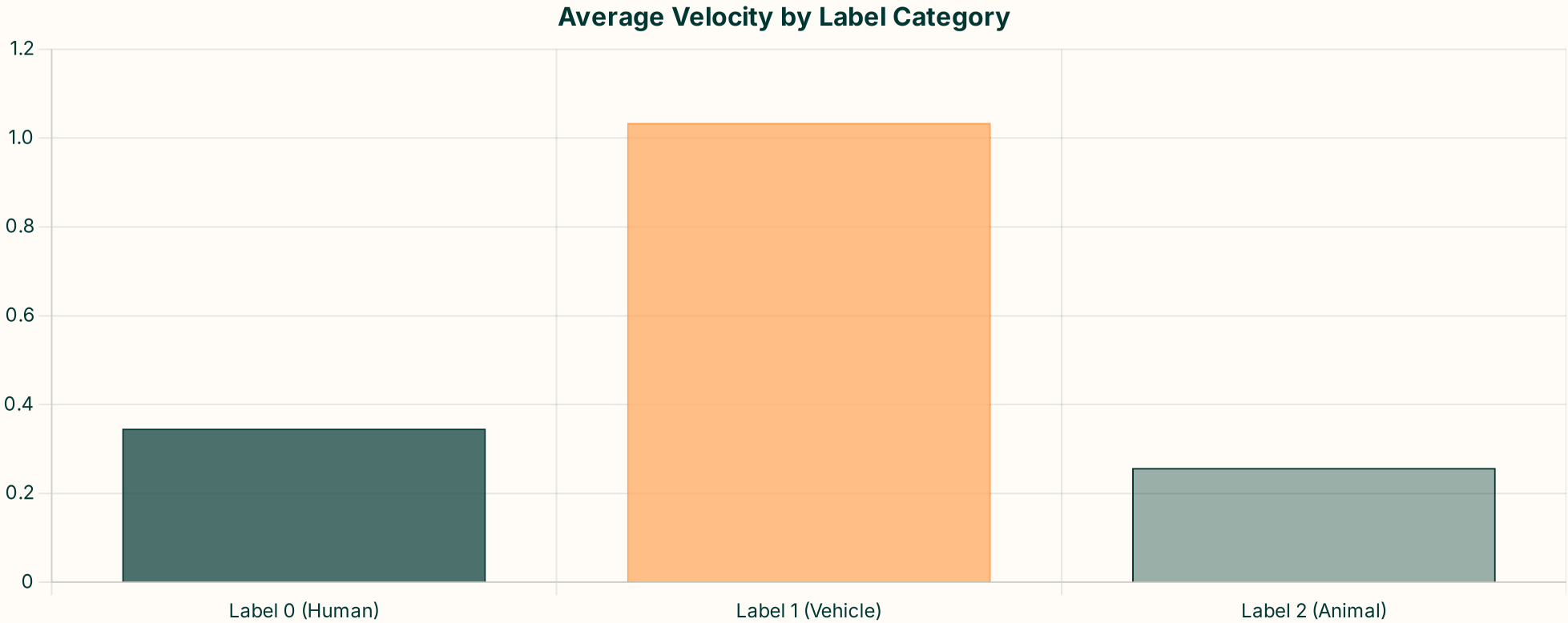
Bar Chart Analysis

Bar charts provide a clear comparison of values across different categories. Here we analyze key metrics across the three label categories in our radar dataset.

Velocity

Risk Range

Speed

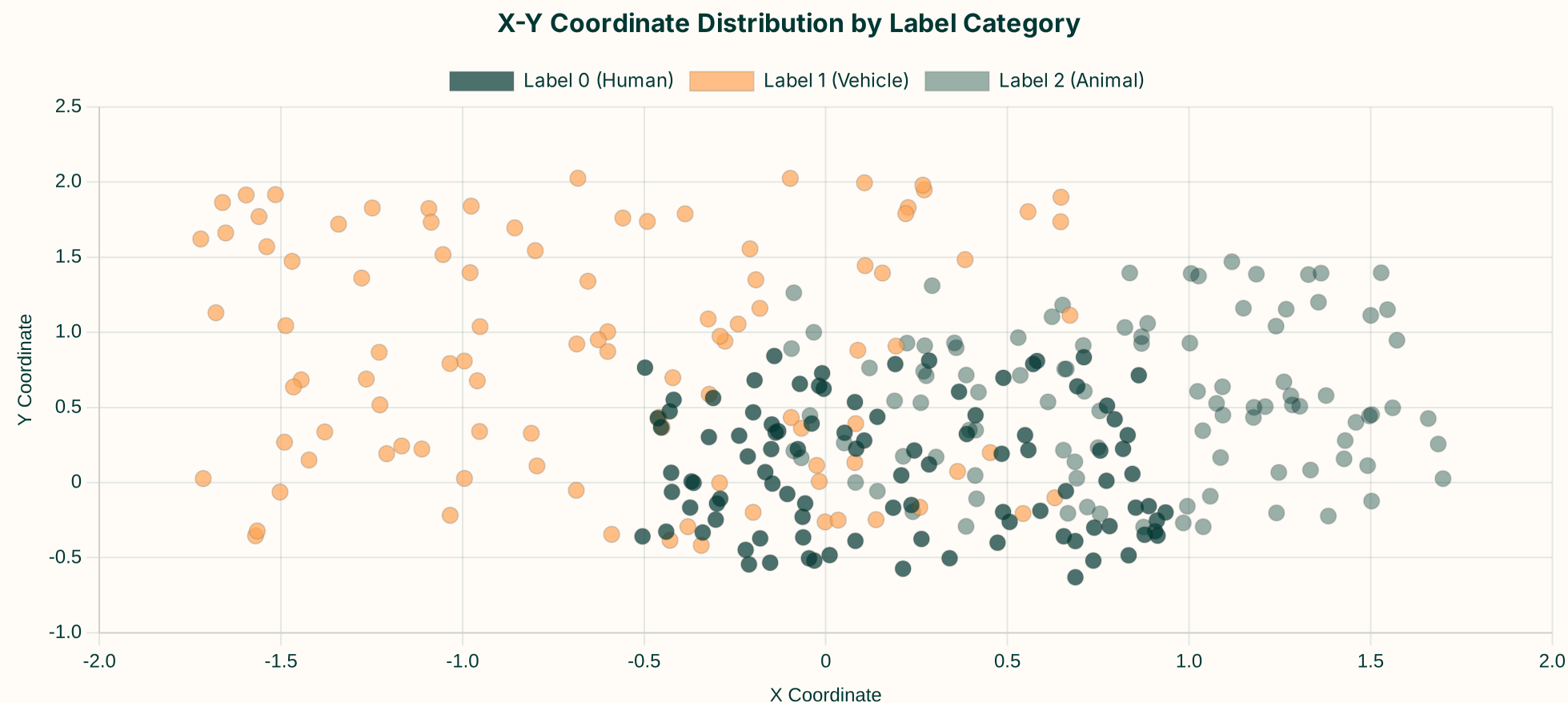


Key Insights

- Label 1 (Vehicle) shows highest average velocity.
- Label 0 (Human) exhibits highest risk assessment.
- Speed metric varies significantly between categories.
- These comparisons reveal distinctive characteristics.

Scatter Plot Analysis

Scatter plots reveal relationships between two continuous variables, with points colored by label category. This visualization shows the relationship between X and Y coordinates.

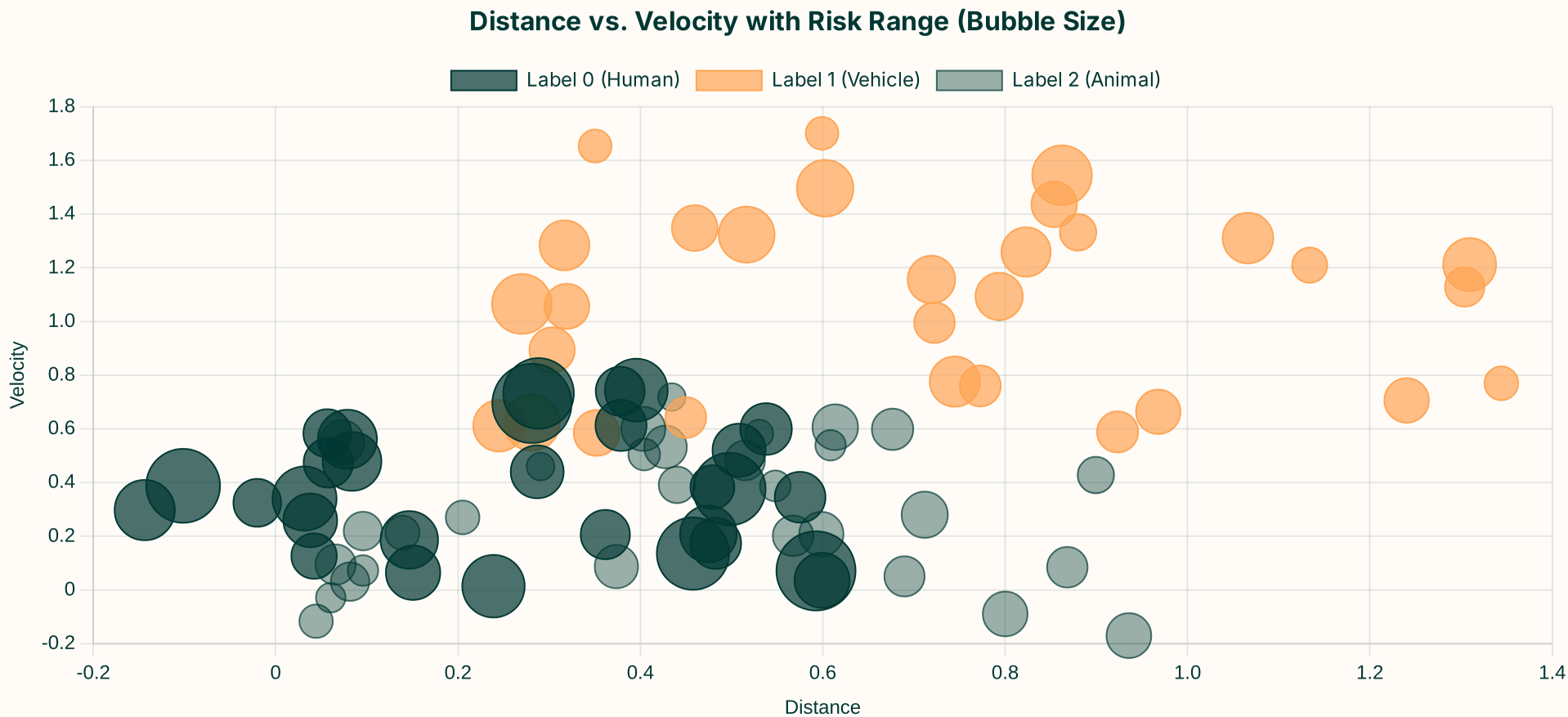


Key Insights

- Label 0 (Human) clusters in the central region.
- Label 1 (Vehicle) shows wider spread across axes.
- Label 2 (Animal) exhibits distinct clustering patterns.
- Clear separation boundaries exist between categories.

Bubble Chart Analysis

Bubble charts extend scatter plots by adding a third dimension represented by bubble size. This visualization shows distance (x-axis), velocity (y-axis), and risk range (bubble size).

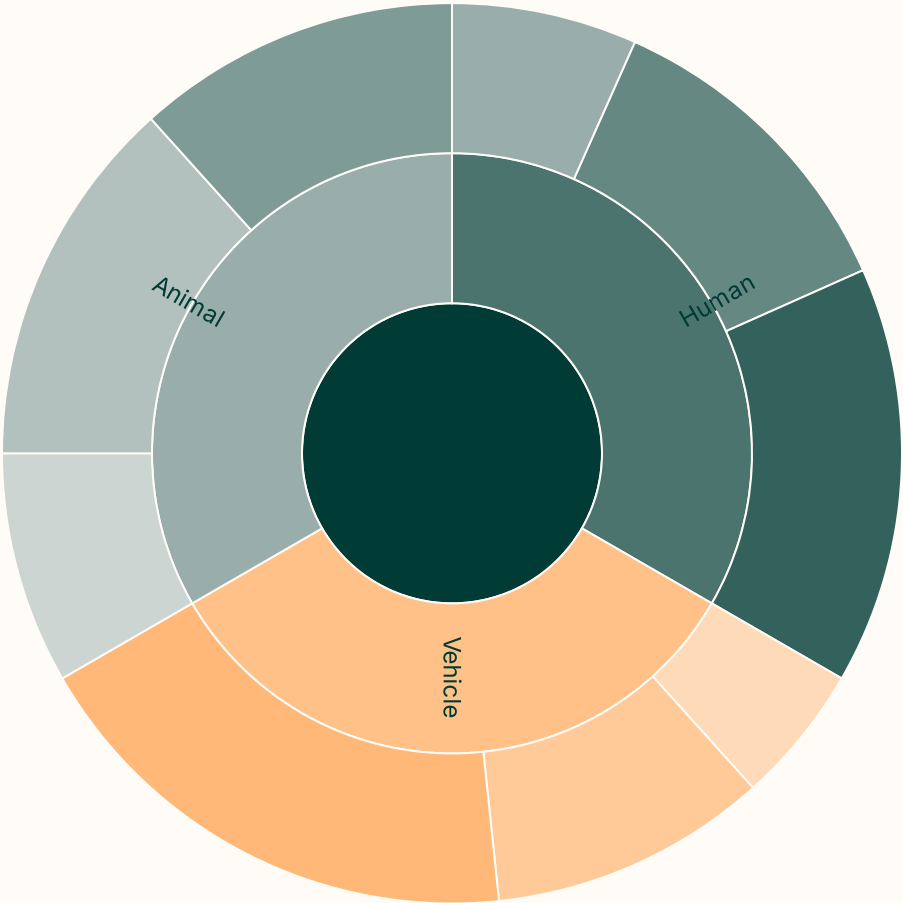


Key Insights

- Label 1 (Vehicle) has larger bubbles, indicating higher risk.
- Label 2 (Animal) has smaller bubbles, showing lower risk.
- Label 0 (Human) shows consistent risk assessment patterns.
- Higher velocities correlate with increased risk ranges.

Sunburst Chart Analysis

Sunburst charts visualize hierarchical data through concentric rings, with each ring representing a level in the hierarchy. This D3.js visualization shows the distribution of radar data across nested categories.



Key Insights

- Label categories show distinct risk distribution patterns.
- Human data shows greater variation in risk assessment.
- Vehicle data has more high-velocity subcategories.
- Hierarchical view reveals nested patterns not visible in other charts.

Interactive Dashboard Preview

The interactive dashboard provides a comprehensive view of the radar data with real-time filtering, customizable visualizations, and drill-down capabilities for deeper analysis.

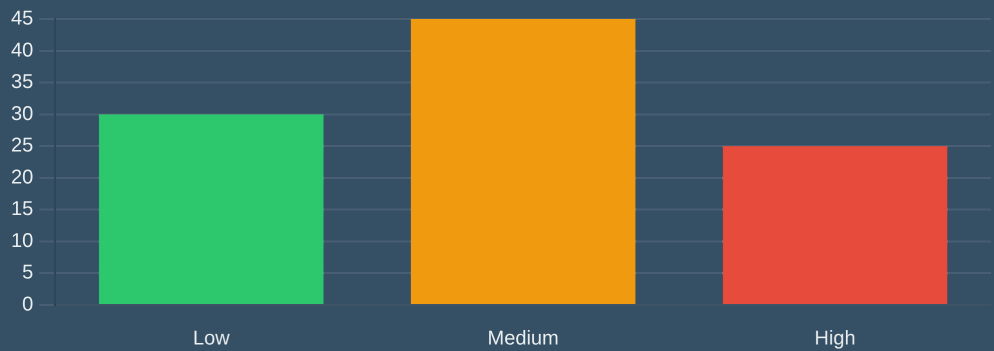
Radar Data Analytics Dashboard

Filter

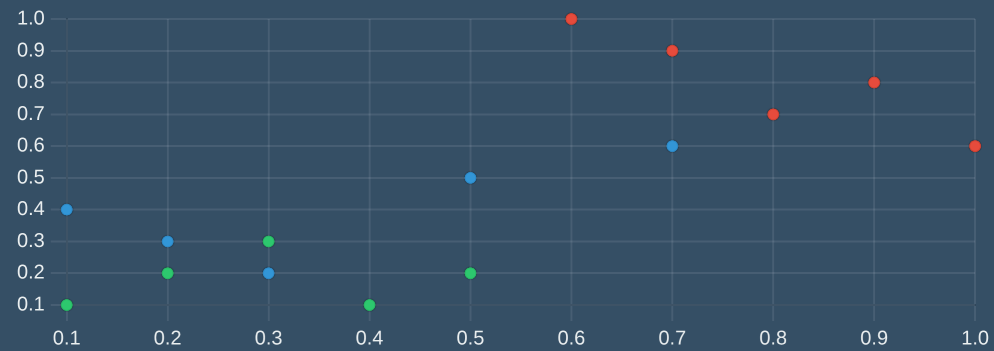
Export

Refresh

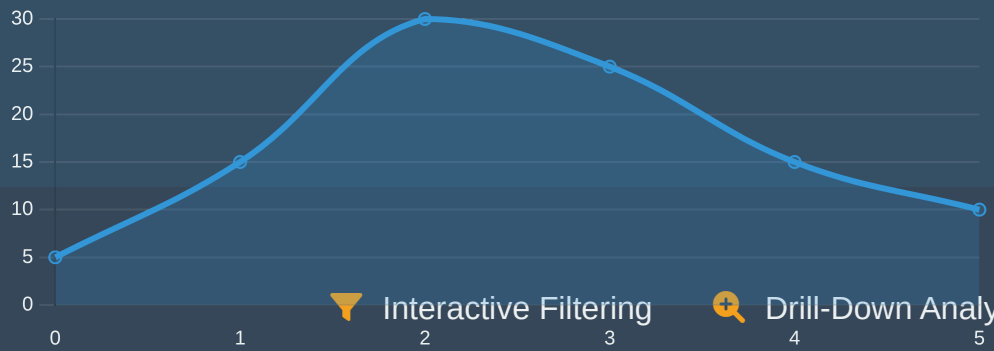
Risk Distribution by Category



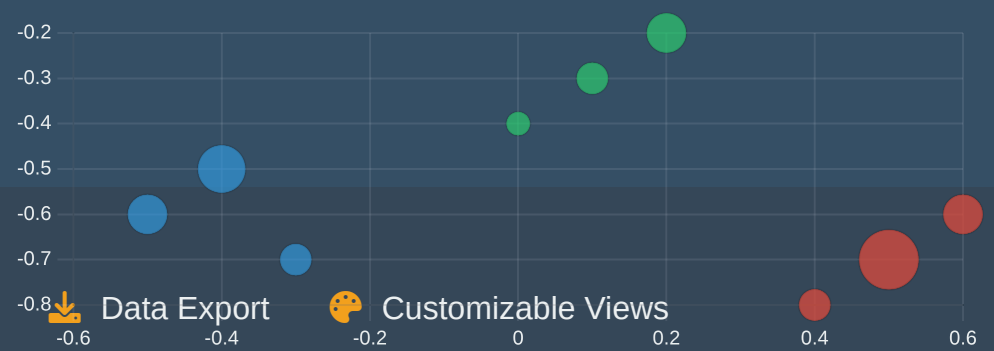
Velocity vs. Distance



Speed Distribution



Angle vs. Intensity



Interactive Filtering

Drill-Down Analysis

Data Export

Customizable Views

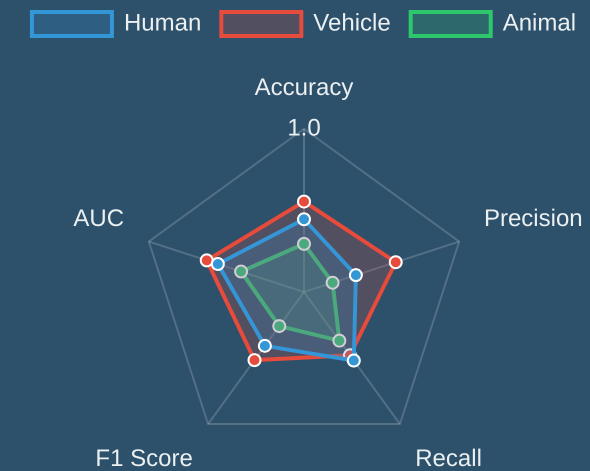
Conclusion & Insights

Our analysis of the radar data has revealed significant patterns and relationships across different dimensions, providing valuable insights for classification and risk assessment.

Key Findings

- Label 1 (Vehicle) shows higher velocity and speed measurements.
- Risk range values are highest for Label 0 (Human).
- Spatial distribution shows distinct clustering patterns.
- Distance-velocity relationship provides strong classification power.

Classification Performance



Visualization Insights

- Radar charts highlight multi-dimensional differences.
- Sunburst charts reveal hierarchical patterns in risk assessment.
- Bubble charts demonstrate relationships between three variables.
- Interactive filtering helps identify outliers and anomalies.

Recommended Next Steps

🤖 Implement ML models for automated classification

🔍 Develop anomaly detection algorithms

📊 Expand the interactive dashboard

🔄 Integrate real-time data processing