Clustering Evaluation Metrics Comparison
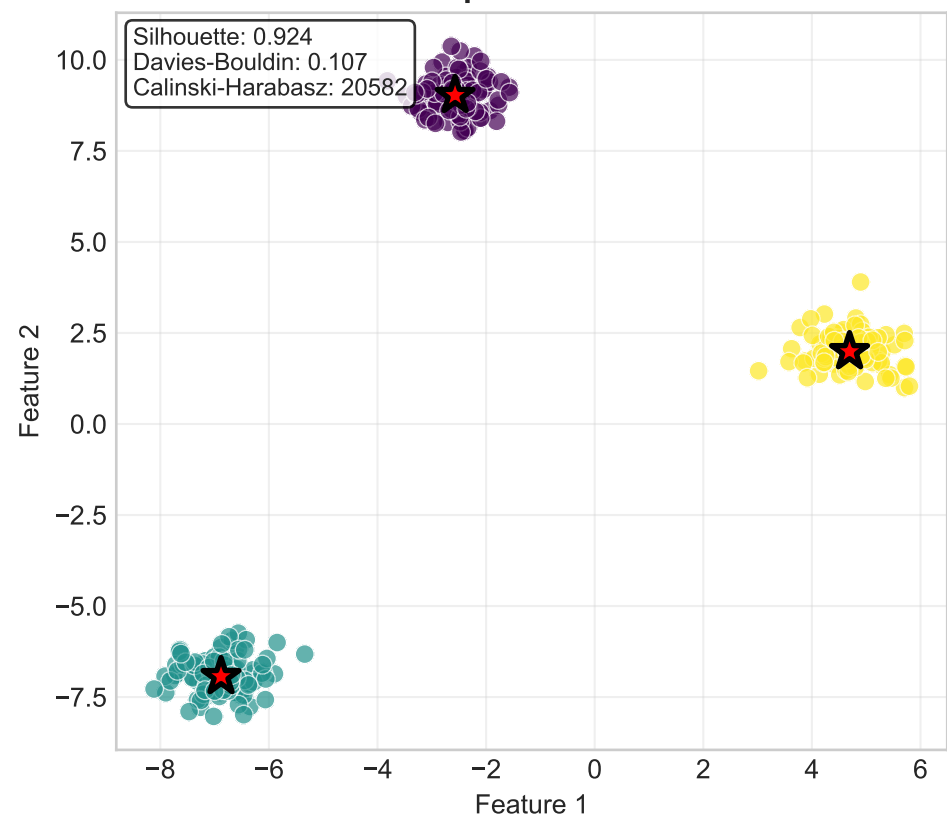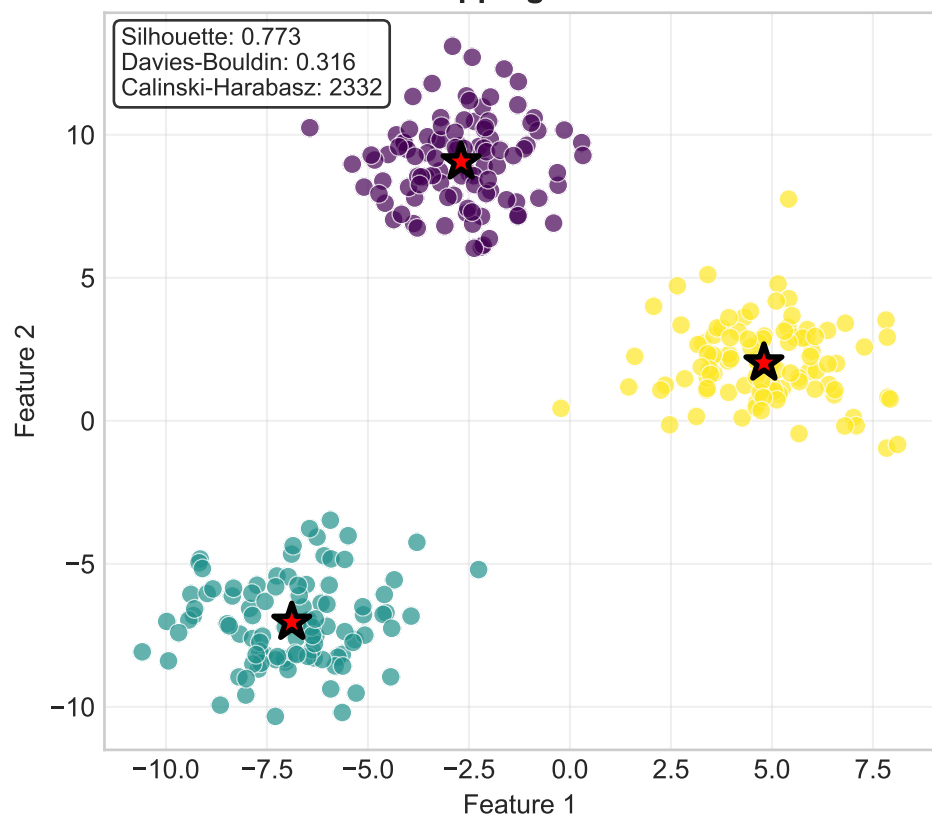**How Different Metrics Behave on Various Data Patterns**
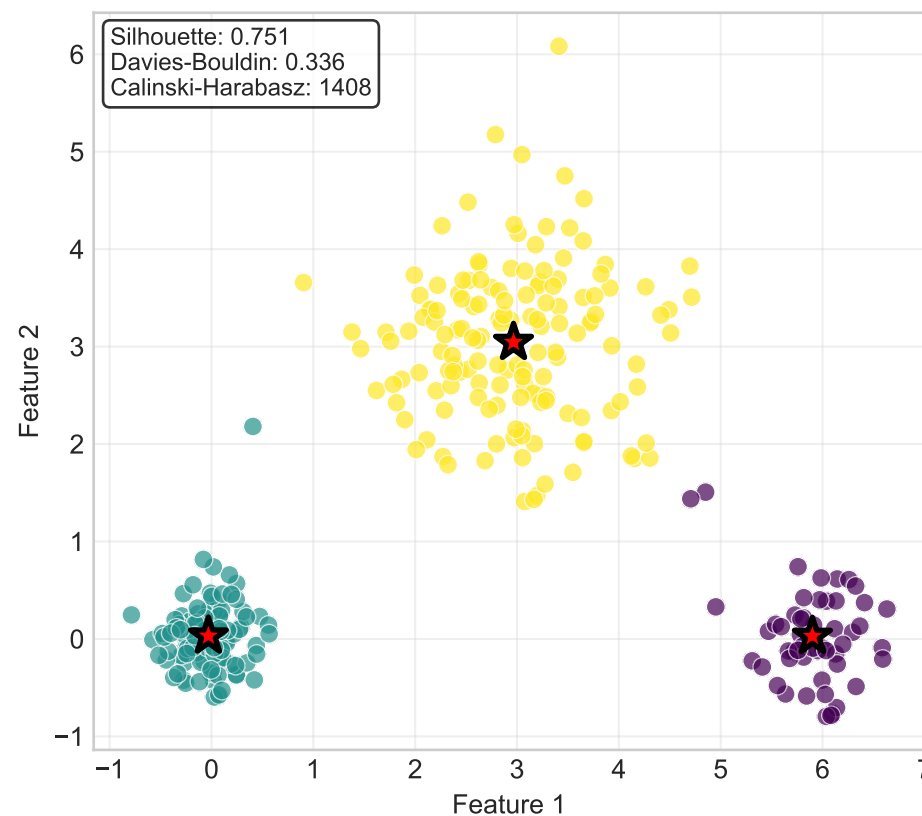
Well-Separated Clusters

Silhouette: 0.924
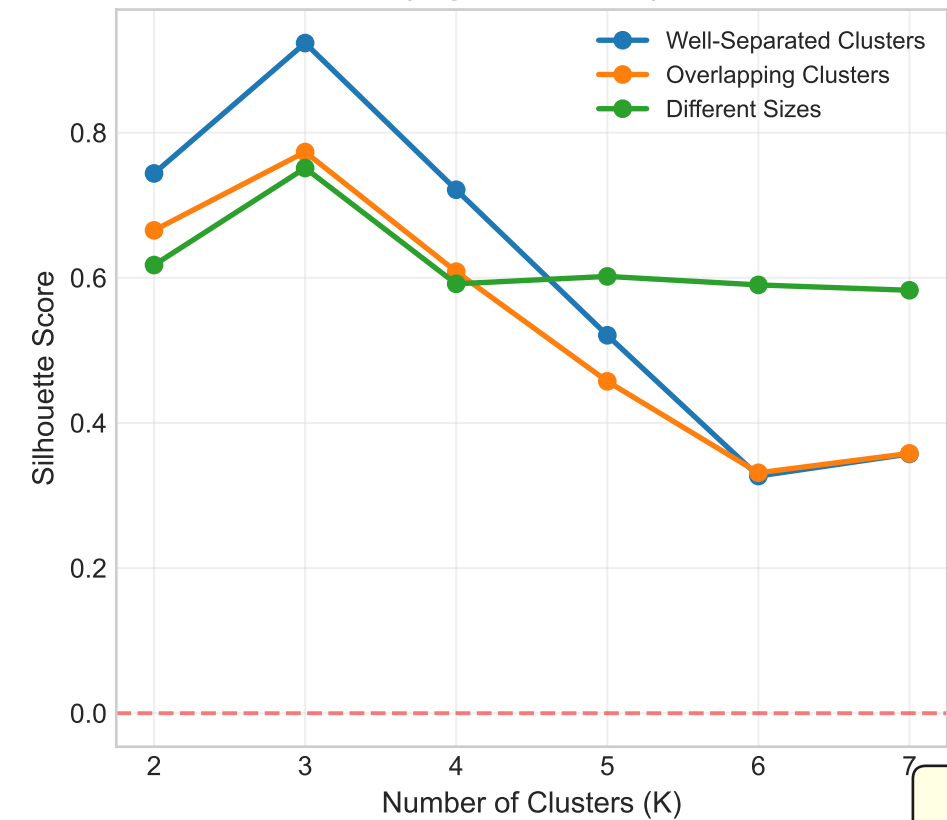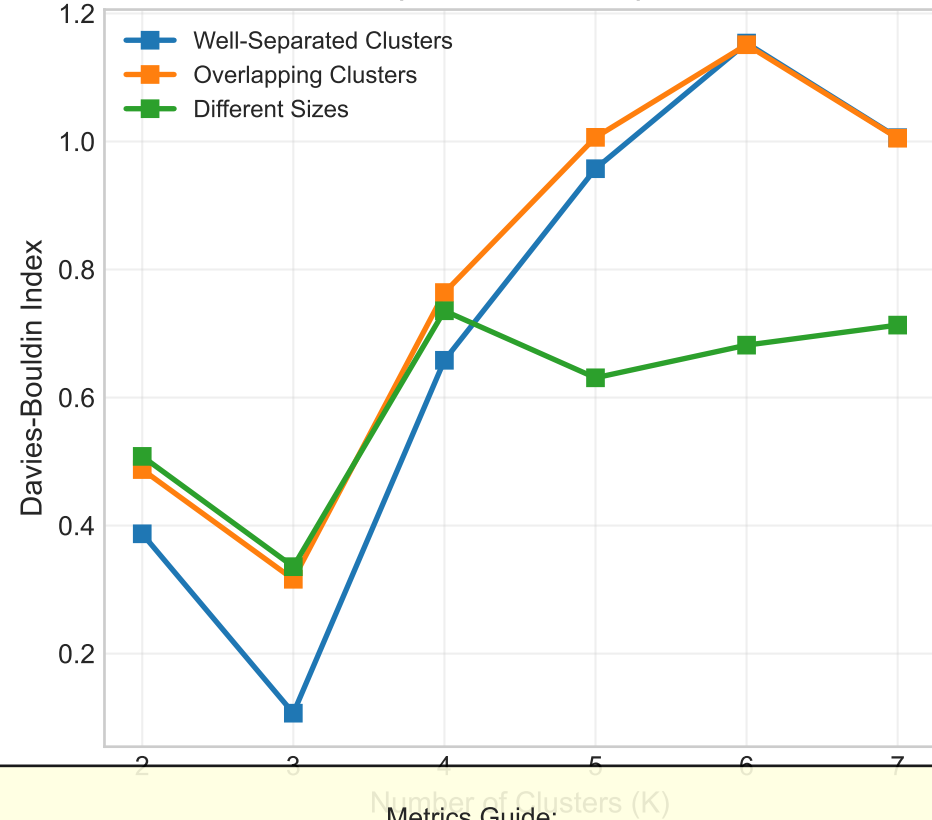Davies-Bouldin: 0.107
Calinski-Harabasz: 20582

Overlapping Clusters

Silhouette: 0.773
Davies-Bouldin: 0.316
Calinski-Harabasz: 2332

Different Sizes

Silhouette: 0.751
Davies-Bouldin: 0.336
Calinski-Harabasz: 1408

Silhouette Score
(Higher is Better)

- Well-Separated Clusters
- Overlapping Clusters
- Different Sizes

Davies-Bouldin Index
(Lower is Better)

- Well-Separated Clusters
- Overlapping Clusters
- Different Sizes

Calinski-Harabasz Index
(Higher is Better)

- Well-Separated Clusters
- Overlapping Clusters
- Different Sizes

Metrics Guide:
• Silhouette: Measures separation between clusters (-1 to 1, higher better)
• Davies-Bouldin: Ratio of within-cluster to between-cluster distance (lower better)
• Calinski-Harabasz: Ratio of between-cluster to within-cluster variance (higher better)