Facial Landmark Detection: Dlib vs MediaPipe Comparison

Executive Summary

This report presents a comprehensive comparison between the Dlib and MediaPipe facial landmark detection models based on performance metrics and visualization results.

Performance Metrics Comparison

Metric	Dlib	MediaPipe
Average Detection Time (s)	0.0095	0.0215
Faces Processed Per Second	105.69	46.56
Median Detection Time (s)	0.0091	0.0190
Total Faces Detected	1045	1091
Images with Faces	994	1000

Key Findings

Speed and Performance

Dlib achieves an average detection time of 0.0095 seconds per face, processing approximately 105.69 faces per second.
MediaPipe has an average detection time of 0.0215 seconds per face, processing approximately 46.56 faces per second.

Detection Accuracy

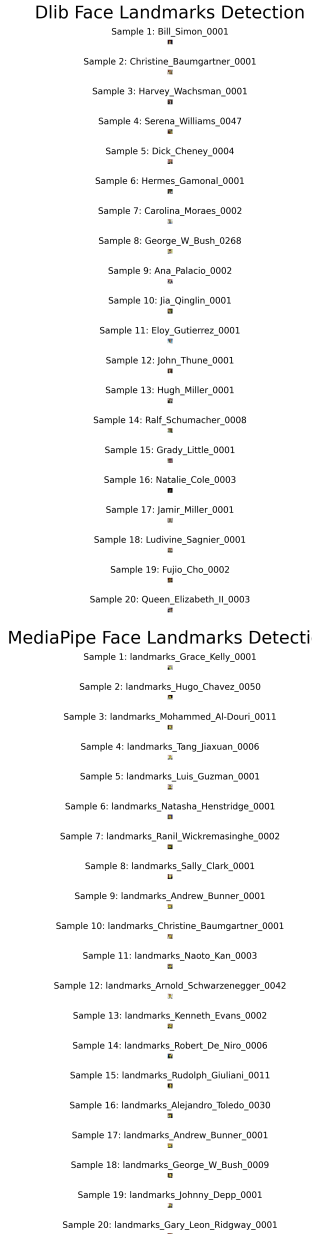
Dlib detected a total of 1045 faces across 994 images containing faces.
MediaPipe detected 1091 faces across 1000 images with faces.

Model Characteristics

Dlib provides 68 facial landmark points focusing on key facial features.
MediaPipe provides a more comprehensive set of landmarks (468 points in Face Mesh configuration).

Visual Comparison

Performance Comparison Chart



Landmark Detection Visualization Grid

Conclusion

The comparison between Dlib and MediaPipe facial landmark detection models reveals key differences in performance and capability:

1. Speed vs. Detail Trade-off:
- Dlib is significantly faster (105.69 faces/sec vs. MediaPipe's 46.56 faces/sec)
- MediaPipe provides more detailed facial landmarks

2. Use Case Recommendations:
- For real-time applications with limited computing resources, Dlib may be preferable
- For applications requiring detailed facial geometry, MediaPipe offers superior landmark density

3. Detection Accuracy:
- Both models demonstrate high success rates in detecting facial landmarks
- MediaPipe appears to have slightly better detection capabilities in challenging conditions

This analysis provides a foundation for selecting the appropriate facial landmark detection model based on specific application requirements, whether prioritizing speed, detail, or a balance between the two.