Determination of Vehicle Speed from Traffic Video

by

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The Speed Detection Algorithm

- Detection and tracking based on optical flow and blob analysis
- Speed computed from lane markers and video frame rate

Advantages of the Speed Detection Algorithm

- Uses a single camera system
- Viewing angle and focal length independent
- Scene independent
- Multiple vehicle detection capability
- Multiple vehicle tracking capability
- A complex problem simplified for fast applications

VEHICLE DETECTION
in a single frame

Fig. 1 Moving object detection

VEHICLE TRACKING
across frames (Example 1)

Fig. 2 Example 1: Moving vehicle tracking across frames, (frames 41, 47, 49)

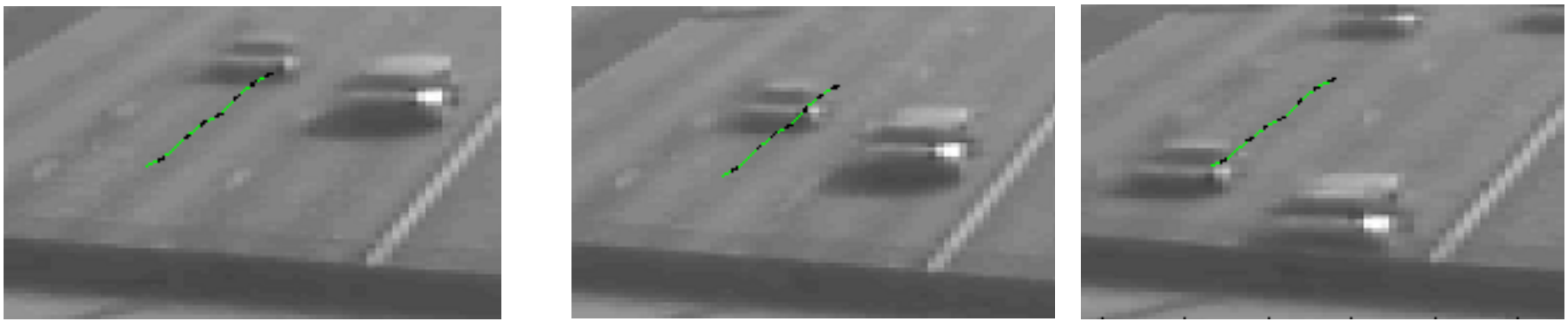

Fig. 3 Close-up of tracked vehicle in Fig. 2

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VEHICLE TRACKING
across frames (Example 2)

Fig. 4 Example 2: Tracking across frames (frames 42, 45, 50) showing multiple vehicle tracking within a frame sequence (see Example 1 frames)

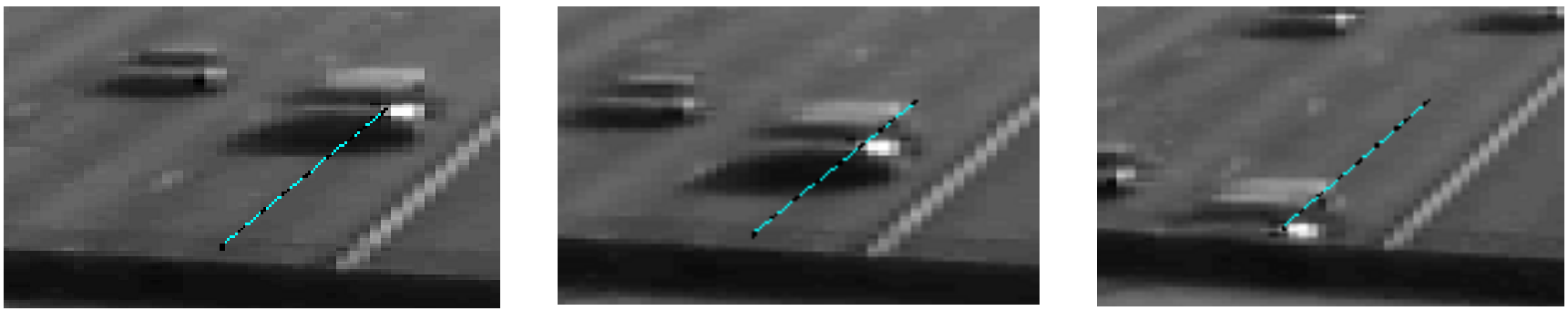

Fig. 5 Close-up of tracked vehicle in Figure 4 (frames 42, 45, 50)

VEHICLE TRACKING
across frames (Example 3)

Fig. 7 Example 3: Tracking across frames (frames 28, 31, 35)

Speed = (distance traveled between frames) / (elapsed time between frames)