Traffic Sign Detection for Vision-based Driver Assistance in Land-based Vehicles
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Motivation
Autonomous vehicle has been an active area of research for a few decades. Intensive research has been done on using a front viewing camera for vehicle localization and navigation, environment mapping, and obstacle avoidance.

Objectives
• Fast: can be implemented in real time
• Low-cost: does not require high quality camera
• Accurate: low false-positive rate
• Robust: invariant to illumination, orientation, partial blockage, etc.

Related Work
• Color-based methods
  - RGB space thresholding [Estevez and Kehtarnavaz, 1996]
  - HSI space thresholding [Kuo and Lin, 2007]
  - HSV space thresholding [Paclik et al., 2000]
• Shape-based methods
  - Gradient-based centroid voting scheme [Loy, 2004]
• Learning-based methods
  - AdaBoost and Haar-like classifiers [Viola and Jones, 2001]

Image Processing Algorithm

Result and Conclusion
• Illumination condition is the key factor in color segmentation step
• Complexity of background results in outliers in Hough transform
• Low resolution is the main difficulty for accurate feature matching
• Machine-learning technique can potentially improve the detection result