**Abstract**

Road detection, which brings a visual perceptive ability to vehicles, is essential to build driver assistance systems. To help detect lane markings in challenging scenarios, one-time calibration of inverse perspective mapping (IPM) parameters is employed to build a bird’s eye view of the road image. We propose an automatic IPM method based on road boundaries called BIRD (Boundary-based IPM for Road Detection), avoiding common problems of fixed IPM. Furthermore, integrating top-down and bottom-up attention, an illumination-robust lane marking detection approach using BIRD is proposed.

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**Experimental Results**

**Contributions**

**BIRD (Boundary-based IPM for Road Detection)**

- **Automatic** - does not need camera calibration
- **Adaptive** - free from problems caused by fixed parameters.
- **Applied** - provides a convenience for feature extraction since the lane marking pixels are aligned to column in the obtained top view image.

**Main Idea**

General methods do lane marking feature extraction for each row independently, so they do not work well in the road scene with shadow interference. Our approach maps road image to the bird's-eye view image, where we can use multi-row information to provide a more robust lane marking detection.

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**Open Source**

- Available at Github → github.com/baidut/OpenVehicleVision
- Released under MIT License