



Vehicle Logo Identification in Real-Time

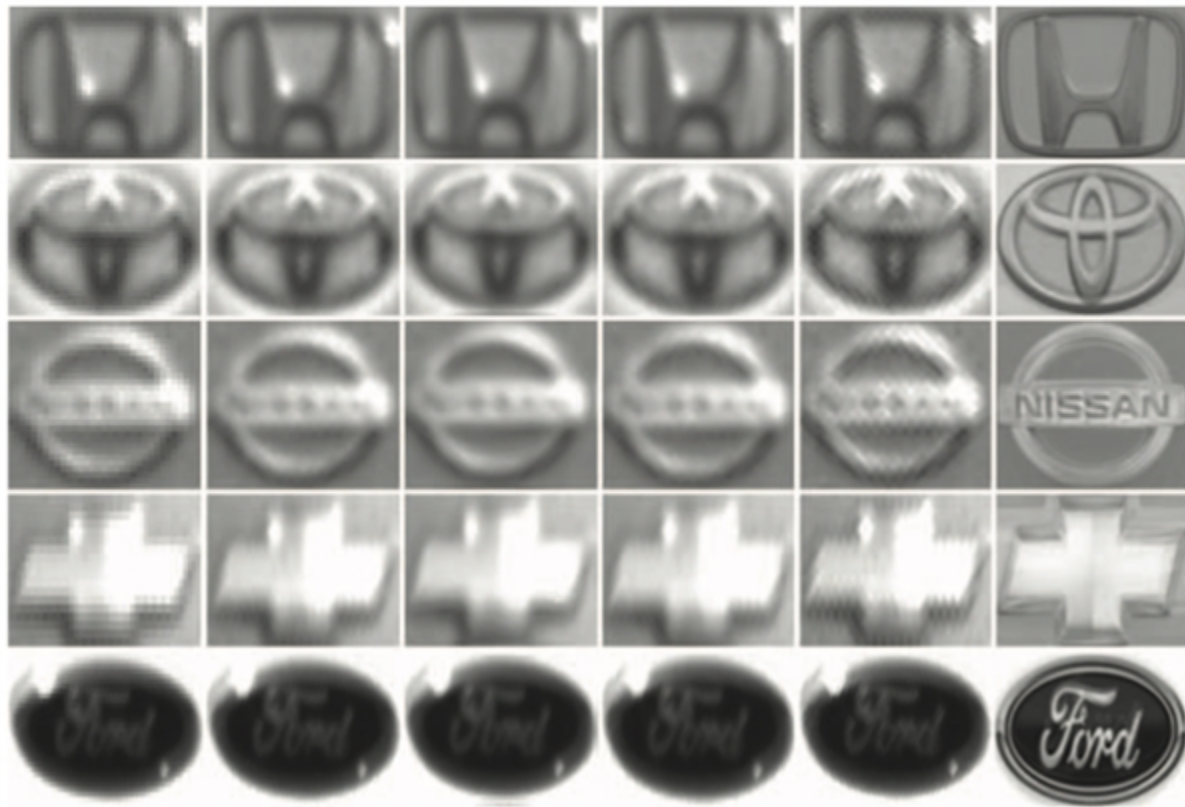
Tech ID: 31904 / UC Case 2012-885-0

BACKGROUND

Vehicle classification has evolved into a significant subject of study due to its importance in autonomous navigation, traffic analysis, surveillance and security systems, and transportation management. While numerous approaches have been introduced for this purpose, no specific study has been conducted to provide a robust and complete video-based vehicle classification system based on the rear-side view where the camera's field of view is directly behind the vehicle.

DESCRIPTION

Prof. Bhanu and his colleagues from the University of California, Riverside have developed a method for recognizing the logo of a vehicle from a low-resolution video feed in real-time. This method works by using a software system for super-resolving the vehicle maker's logos, which facilitates recognition of a vehicle make more reliably than low-resolution vehicle logos. A super-resolution algorithm produces a high-resolution image from low-resolution video input.



Sample super-resolution results comparison - from left to right (a) Low-resolution images (enlarged by pixel replication), (b) Bicubic interpolation (c) Kernel Regression, (d) Iterative Curve Based Interpolation, (e) Adaptive Sparse Domain Selection, and (f) Current invention. For display purpose all the images are normalized to the same size.

ADVANTAGES

- ▶ The machine learning system outperforms existing methods both qualitatively and quantitatively.
- ▶ Lower complexity of algorithm allows for practical applicability to real time vehicle & logo identification.
- ▶ The method is tolerant of low-quality, low-resolution and illumination & reflectivity of the input image.
- ▶ Eliminates the need for close-up images.

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OTHER INFORMATION

KEYWORDS

vehicle logo identification, super-resolution image, real-time, low-resolution

CATEGORIZED AS

- ▶ **Computer**
 - ▶ Software
- ▶ **Imaging**
 - ▶ Other

RELATED CASES

2012-885-0, 2011-369-0, 2011-712-0,
 2012-863-0

- ▶ The vehicle logo details are faithfully reconstructed eliminating noise, blurriness and specularities.

APPLICATION

To identify the logo of a vehicle from a low-resolution video feed in real-time in applications such as:

- ▶ Automation of parking lot management
- ▶ Surveillance and security
- ▶ Transportation and toll management
- ▶ Real-time traffic analysis
- ▶ Autonomous navigation

RELATED MATERIALS

- ▶ [Vehicle logo super-resolution by canonical correlation analysis.](#)

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,127,437	11/13/2018	2012-885

INVENTIONS BY PROF. BHANU

- ▶ Please see all [inventions by Prof. Bhanu and his team at UCR](#)
- ▶ Please visit Prof. Bhanu's [Visualization and Intelligent Systems Lab](#) to learn more about the group's research.

RELATED TECHNOLOGIES

- ▶ [A Video Based Hierarchical Vehicle Classification System](#)
- ▶ [Rear View Vehicle Classification Using Computer Vision](#)
- ▶ [Vehicle Make and Model Identification](#)

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