Vehicle Make and Model Identification

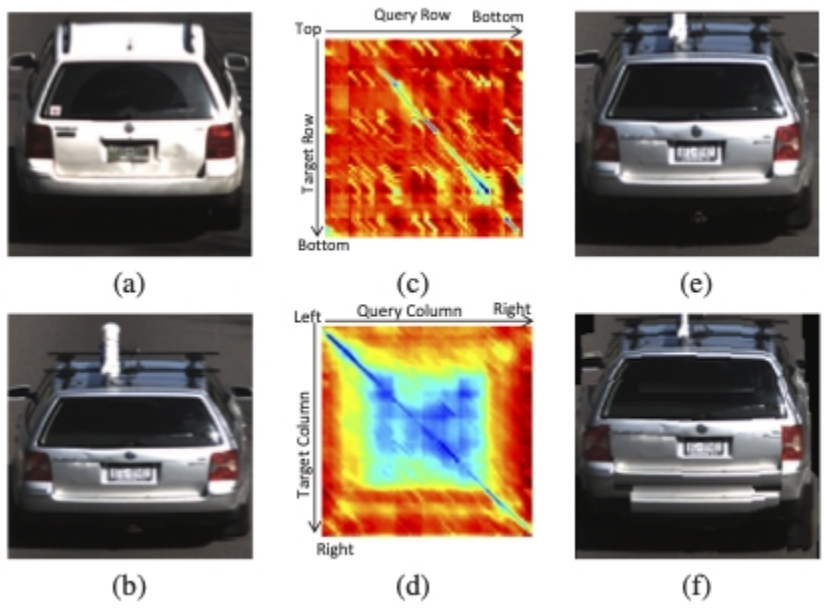
Tech ID: 31931 / UC Case 2012-863-0

BACKGROUND

The identification of vehicles has evolved into a significant subject of study due to its importance in autonomous navigation, traffic analysis, surveillance and security systems, and for transportation management. The identification of both vehicle make and model has been very challenging since it must be robust to illumination changes, shadows, partial detections, occlusion, tracking failure, imaging system changes, camera viewpoint changes, etc. Current vehicle classification methods that rely on blob features or appearance features cannot meet these requirements.

BRIEF DESCRIPTION

Prof. Bir Bhanu and his colleagues from the University of California, Riverside have developed a method for analyzing real-time video feed of vehicles from a rear view perspective to identify the make and model of a vehicle. This method works by using a software system for detecting the Regions-of-Interest (ROIs) of moving vehicles and moving shadows, computing structural and other features and using a vehicle make and model database for vehicle identification. The system performs calculations based on factors found in all vehicles, so it is reliable regardless of vehicle color and type. The system is compatible with low resolution video feed, so it is able to analyze video feed in real-time. Thus, this technology holds potential for innovating fields like vehicle surveillance, vehicle security, class-based vehicle tolling, and traffic monitoring where reliable real-time video analysis is needed.



Two Step alignment: (a) Target image (b) Query Image, (c) Vertical alignment cost (Hotter colors indicate higher cost) and solution (blue line), (d) Horizontal alignment alignment cost and so- lution, (e) Aligned query, (f) Query aligned with SIFTflow

CONTACT

Venkata S. Krishnamurty
venkata.krishnamurty@ucr.edu
tel: .

OTHER INFORMATION

KEYWORDS

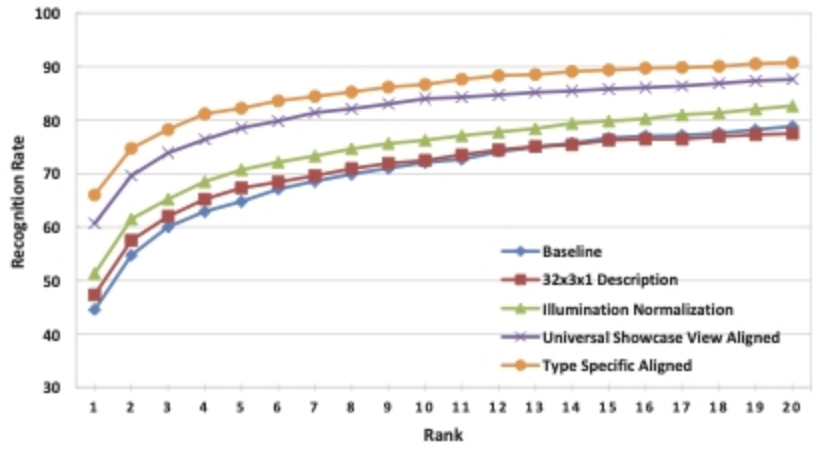
Structural features, Make and Model Recognition, Vehicle Clearance, Shadow removal, Height estimation, Vehicle identification

CATEGORIZED AS

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

RELATED CASES

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



Cumulative match characteristic for top 20 retrievals demonstrating significant improvement over the baseline

APPLICATIONS

- To identify the make and model of a vehicle from low-resolution video feed in real-time
- For the analysis of video feed for vehicle surveillance, vehicle security, class-based vehicle tolling, and traffic monitoring

RELATED MATERIALS

- N. Thakoor, B. Bhanu, "Structural signatures for passenger vehicle classification in video," IEEE Transactions on Intelligent Transportation Systems, Vol. 14, No. 4, 2013. - 12/01/2013
- Efficient alignment for vehicle make and model recognition

INVENTIONS BY PROF. BHANU

Please see all inventions by Prof. Bhanu and his team at UCR

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,223,609	03/05/2019	2012-863

RELATED TECHNOLOGIES

- A Video Based Hierarchical Vehicle Classification System
- Rear View Vehicle Classification Using Computer Vision
- Vehicle Logo Identification in Real-Time

University of California, Riverside

Office of Technology Commercialization

200 University Office Building,

Riverside,CA 92521

otc@ucr.edu

https://research.ucr.edu/