



AUTOMATIC SEAT BELT DETECTION BASED ON DEBC

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ABSTRACT

This paper presents a novel method for the detection of seat belt in a monitoring image which contains the full scene information of the moving car. First, the driver area is located based on the vehicle outline. Then the potential seat belt edges are detected by an effective algorithm based on the direction information measure in the HSV color space.

Result is finally obtained by further verification of the edges. Experiments demonstrate the method makes a good performance even with noisy images.

INTRODUCTION

Worldwide more than 1.2 million people die each year in vehicle accidents. But they would have 40-50% probability of survival if they use seat belt properly.

So ensuring that seat belt is worn by every driver is a very important active safety measure. Therefore an approach is proposed which can detect the seat belt automatically in the images taken by surveillance camera.

BACKGROUND OVERVIEW

A. Existing System

A seat belt detection system for a vehicle, comprising: a seat belt assembly, also done by ; an

image sensor, located within the vehicle as to be able to receive an image of at least a portion of the seat belt assembly; an image processor, operable to analyze the image to identify said plurality of indicators for image analysis; the image analysis matching the identified plurality of indicators to a predefined set of indicators that characterize at least one particular status for the seat belt assembly.

B. Drawbacks of Existing System

The current practice leads to the following major drawbacks...

- Needs skilled person for installation purpose.
- Quite expensive
- Any object can come inbetween sensor and drivers region.

C. Proposed System

In our system we are detecting the seat belt using image processing. Here camera will capture the area of drivers region. Camera will be planted in the car itself. If driver is not wearing the seat belt then alarm will turn on giving loud sound. Message will also be displayed on screen. The alarm will keep on ringing until the driver wears seat belt.

This will alert the traffic inspector and fine will be charged to driver.

this phenomenon. We have developed a mechanism for providing drive with more security through an extra layer of lock near the seat belt buckle. The driver is not permitted to drive without the seatbelt. This reduces the risk of fatality to the driver and the occupants. Through our testing we have provided mechanism for safety even during conditions where a driver applies break, the system can be further tested by incorporating the same in real vehicles.

IV. ENHANCEMENTS

A. Limitations

As generally all systems have some limitation, here are some listed for the proposed system...

- Seat belt should be of specific length
- Seat Belt used should of special material

B. Drawbacks

This system has certain drawbacks also as listed...

- Camera should be of good resolution

C. Future Modifications

There is always chance to improve the any system as research & development is an endless process. Our system is no exception to this phenomenon. The following improvements can be done...

- SMS Facility can also be provided.
- Message can be sent to the traffic inspector also.

REFERENCES

- Manby, Frederic (24 August 2009). "Clunk, click – an invention that's saved lives for 50 years". *Yorkshire Post* (Johnston Press Digital Publishing). Retrieved 2010-12-04.
- **Jump up** ^ Andréasson, Rune; Claes-Göran Bäckström (2000). *The Seat Belt : Swedish Research and Development for Global Automotive Safety*. Stockholm: Kulturvårdskommittén Vattenfall AB. p. 12. ISBN 91-630-9389-8.
- C. Hunter Shelden, M.D., (November 5, 1955). "Prevention, the only cure for head injuries resulting from automobile accidents". *Journal of the American Medical Association*. doi:10.1001/jama.1955.02960270001001.
- "The man who saved a million lives: Nils Bohlin - inventor of the seat belt - Features, Gadgets & Tech". *The Independent*. 2009-08-19. Retrieved 2009-12-08.
- "Automobile safety belt system - Patent 2855215". *Freepatentsonline.com*. 1958-10-07. Retrieved 2011-04-03.

- **Jump up** ^ Andréasson, Rune; Claes-Göran Bäckström (2000). *The Seat Belt : Swedish Research and Development for Global Automotive Safety*. Stockholm: Kulturvårdskommittén Vattenfall AB. pp. 15–16. ISBN 91-630-9389-8. .
- **Jump up** ^ "A Potted Seat Belt History". *Drivers Technology*.
- **Jump up** ^ "Federal Motor Vehicle Safety Standards; Occupant Crash Protection. Final Rule". *Nhtsa.dot.gov*. Retrieved 2011-02-02.
- **Jump up** ^ "Three-point seatbelt inventor Nils Bohlin born, History Channel".
- **Jump up** ^ "Volvo's Three-Point Safety Belt Celebrates 50 Years of Saving Lives, The Auto Channel".
- **Jump up** ^ "Autoliv Inc - What we do - Seatbelts"^[*dead link*]
- **Jump up** ^ Lankard, Tom. "The first seat offered in the U.S. that incorporated a three-point belt—on the 1990 Mercedes-Benz SL—". *Editorial.autos.msn.com*. Retrieved 2011-02-02.
- Silke, Sharon (2009-11-06). "Ford says inflatable seat belt improves safety, comfort, too". *USA Today*. *usatoday.com*. Retrieved 2011-04-03.
- **Jump up** ^ "Experimental Safety Vehicle". *Classicvw.org*. Retrieved 2011-02-02.
- **Jump up** ^ "SAFETY SELLS: Chapter 3" (PDF). Retrieved 2011-02-02.
- ^ **Jump up to:** ^a ^b "Passive-Belt Activity". *The New York Times*. 1978-03-26.
- **Jump up** ^ "Airbags, seat belts to be mandatory in every car by 1983". *Daily Collegian*. 1977-07-01. Retrieved 2009-12-03.
- **Jump up** ^ "Air Bags, Automatic Seat Belts". *Los Angeles Times*. 1977-10-04.
- **Jump up** ^ "GM Offers Automatic Seat Belts". *Chicago Tribune*. 1978-06-27. p. 8.
- **Jump up** ^ "GM's Automatic Seat Belts Go on Chevettes". *Los Angeles Times*. 1978-06-27.
- **Jump up** ^ "Sales of Automatic Seat Belts Disappointing, Chevrolet Says". *Toledo Blade*. 1979-02-23. p. 1. Retrieved 2009-12-03.
- **Jump up** ^ Girard, Penny (1978-08-31). "Study Finds Automatic Seat Belts, Airbags Save Lives". *St. Petersburg Times*. p. 1. Retrieved 2009-12-03.

- "US to require airbags or automatic seat belts". *Chicago Tribune*. 1984-07-11. p. 1.
- **Jump up** ^ "Canadian vehicle importation regulations". Riv.ca. Retrieved 2011-02-02.
- **Jump up** ^ "'3+2 Point Seatbelt and Side-Support Airbag'". Web.archive.org. 2008-05-13. Retrieved 2013-09-30.
- **Jump up** ^ "'Ford researches possible next-generation safety belt technology'". Media.ford.com. 2007-12-29. Retrieved 2011-02-02.
- **Jump up** ^ [Volvocars corporate website](#)^[dead link]
- **Jump up** ^ Ichikawa M, Nakahara S, Wakai S (January 2002). "Mortality of front-seat occupants attributable to unbelted rear-seat passengers in car crashes". *Lancet* **359** (9300): 43–4. doi:10.1016/S0140-6736(02)07279-3. PMID 11809187.
- **Jump up** ^ Derbyshire, David (2002-01-04). ""Unbelted rear passengers 'biggest danger in crash'"". Telegraph.co.uk. Retrieved 2012-08-31.
- **Jump up** ^ Winston FK, Durbin DR, Kallan MJ, Moll EK (June 2000). "The danger of premature graduation to seat belts for young children". *Pediatrics* **105** (6): 1179–83. doi:10.1542/peds.105.6.1179. PMID 10835054.
- **Jump up** ^ "Kids at Risk: When Seatbelts are NOT Enough", by Karp H, *Reader's Digest* (US Edition), November 1999.
- ^ **Jump up to:** ^a ^b Nakahara S, Ichikawa M, Wakai S (2003). "Seatbelt legislation in Japan: high risk driver mortality and seatbelt use". *Inj. Prev.* **9** (1): 29–32. doi:10.1136/ip.9.1.29. PMC 1730910. PMID 12642555.

