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A review of road traffic accidents reconstruction methods and their limitations with respect to the national legal frameworks

Irina Duma, Nicolae Burnete, Adrian Todorut

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Abstract

Road traffic accidents are the main issue in terms of public safety among Romania and Europe. Reconstructionists aim to ease their work and to offer results as exact as possible, by using a variety of reconstruction methods, from numerical modelling to software simulations of the collisions in which vehicles are involved. Depending on the conditions of a road traffic event, several methodologies can be used, with proper validation. However, the national legal frameworks may be considered as barriers in using a large variety of reconstruction methods. Therefore, this area of research should be further developed, in order to enlarge experts' choice, especially in the context of rapid development of the automobile industry.

Keywords: road traffic accidents, collisions simulations

References

1. Bobos B. 2008 Cercetări privind reconstituirea coliziunii autovehiculelor (Cluj-Napoca, Romania: Risoprint Publishing House) ISBN 978-973-751-796-8
Go to reference in article
Google Scholar
2. Brown R., Lewis L., Hare B., Jakstis M. et al 2012 Confirmation of Toyota EDR Pre-crash Data SAE Technical Paper 2012-01-0998 https://doi.org/10.4271/2012-01-0998;
Go to reference in article
Google Scholar
3. Crouch M. and Cash S. 2017 Video analysis in collision reconstruction (Independent Publishing Network) ISBN-13: 978-1788089302
Go to reference in article
Google Scholar
4. Duma I., Burnete N., Todorut A. and Truscá D. 2021 XXIX International Scientific Conference on Transport, Road-Building, Agricultural, Hoisting & Hauling and Military Techniques and Technologies 'trans&MOTAUTO2021', print ISSN: 1313-5031, online ISSN: 2535-0307, Year IV (Sofia, Bulgaria) Determination of pre-collision travel speed in the event of a frontal collision between a vehicle and a fixed obstacle, using video recordings

Go to reference in article
Google Scholar

5. Franck H. and Franck D. 2010 Mathematical methods for accident reconstruction. A forensic engineering perspective (CRC Press)
Go to reference in article
Google Scholar

6. Gaiginschi R 2009 Reconstruct si expertiza accidentelor rutiere (Bucharest, Romania: Technical Publishing House) ISBN 978-973-31-2345-3
Go to reference in article
Google Scholar

7. Huang M. 2002 Vehicle crash dynamics (CRC Press)
Go to reference in article
Google Scholar

8. Huang M. 2002 Vehicle crash mechanics (CRC Press)
Go to reference in article
Google Scholar

9. Kolla E., Ondruš. J and Vertal'. P. 2019 Reconstruction of traffic situations from digital video-recording using method of volumetric kinetic mapping (Slovakia) The Archives of Automotive Engineering - Archiwum Motoryzacji
Go to reference in article
Google Scholar

10. Lawrence J. and Wilkinson C. 2005 The Accuracy of Crash Data from Ford Restraint Control Modules Interpreted with Revised Vetronix Software SAE Technical Paper 2005-01-1206 https://doi.org/10.4271/2005-01-1206;
Go to reference in article
Google Scholar

11. Neale W., Fenton S., McFadden S. and Rose N. 2004 A video tracking photogrammetry technique to survey roadways for accident reconstruction SAE Technical Paper, ISSN: 0148-7191, United States
Go to reference in article
Google Scholar

12. Randall K.N. 2001 Forensic engineering investigation (CRC Press) ISBN 0-8493-0911-5
Go to reference in article
Google Scholar

13. Struble D.E. 2014 Automotive accident reconstruction. Practices and principles (CRC Press)
Go to reference in article
Google Scholar

14. Todorut A. 2008 Dinamica accidentelor de circulatie (Cluj-Napoca, Romania: UT Press Publishing House) ISBN 978-973-662-383-7
Go to reference in article
Google Scholar

15. Todorut A. and Cordos N. 2017 Modele fizico-matematice ín dinamica accidentelor de circulatie rutierá (Cluj-Napoca, Romania: UT Press Publishing House) ISBN 978-606-737-267-0
Go to reference in article
Google Scholar

16. Van Kirk D.J. 2001 Vehicular accident reconstruction (CRC Press) ISBN 0-8493-2020-0
Go to reference in article
Google Scholar

17. Weber M. 2006 The Query Project. Developing guidelines for a best practice qualification of accident analysts (Germany: European Association for Accident Research and Analysis) ISBN 978-3-00-019328-6
Go to reference in article
Google Scholar
18. European Commission (2020), Road safety targets - Monitoring report June 2020, European Road Safety Observatory, Brussels, European Commission, Directorate General for Transport,https://ec.europa.eu/transport/road_safety/sites/default/files/pdf/monitoring_report_november_2020.pdf (accessed on 12/08/2021);
Go to reference in article
Google Scholar
19. Crash Data Group, https://crashdatagroup.com/ (accessed on 12/08/2021);
Go to reference in article
Google Scholar
20. European Commission, 2020 Road Safety Statistics, https://ec.europa.eu/transport/modes/road/news/2021-04-20-road-safety-statistics-2020_en (accessed on 03/08/2021);
Go to reference in article
Google Scholar
21. European Commission, Road Safety, https://ec.europa.eu/transport/modes/road/news/2021-04-20-road-safety_en (accessed on 12/08/2021);
Go to reference in article
Google Scholar
22. Government Ordinance no. 75/2000 on the organization of the activity of forensic expertise, published in the Official Gazzette Part I, no. 407/2000, amended and completed with Law no. 488/2002 and Law no. 156/2011, https://ec.europa.eu/growth/tools-databases/regprof/index.cfm?action=regprof&id_regprof=40287;http://legislatie.just.ro/Public/DetaliiDocument/24022 (accessed on 11/10/2021);
Go to reference in article
Google Scholar
23. National Institute of Forensic Expertise - NIFE (Institutul National de Expertiză Criminalistics - INEC), https://www.inec.ro/index.php/activitate/expertize, Romania (accessed on 12/08/2021);
Go to reference in article
Google Scholar
24. National Highway Traffic Safety Administration (NHTSA), Event Data Recorder, https://www.nhtsa.gov/research-data/event-data-recorder#overview-10516 (accessed on 12/08/2021);
Go to reference in article
Google Scholar
25. National Highway Traffic Safety Administration (NHTSA), Summary of findings by the NHTSA Event Data Retrieval Working Group, August, 2001.
Go to reference in article
Google Scholar