
사고재현 및 사고사례 분석 I



첨단안전장치 장착 자동차의 사고사례 분석

박종진* · 박정만** · 인병덕***

Analysis for Traffic Accident of the Vehicle with Advanced Driver Assistance System(ADAS)

Jongjin Park*, Jeongman Park**, Byungduk In***

Key Words : Advanced driver assistance system(첨단안전장치), Autonomous emergency braking system(비상자동제동장치), Adaptive cruise control(적응형 크루즈 컨트롤), Digital tacho graph(전자식운행기록계), Event data recorder(사고기록장치), Traffic accident investigation(교통사고조사)

ABSTRACT

국토교통부에서 2022년 9월 19일에 모빌리티 혁신 로드맵에 완전자율주행 버스·셔틀(2025년) 및 구역 운행 서비스 상용화(2027년) 등을 통해 기존의 대중교통 체계를 자율주행 기반으로 대전환한다는 내용을 발표하였다. 그러나, 아직 Level 3 이상의 자율주행자동차에 대한 사고분석 체계가 갖춰져 있지 않은 상황에서 향후 발생할 자율주행자동차 교통사고에 대한 책임소재 규명과 사고원인 분석을 준비해야 한다. 이에 본 연구에서는 AEB(Autonomous Emergency Braking System), LKAS(Lane Keeping Assistance System), ACC(Adaptive Cruise Control) 등과 같은 ADAS (Advanced Driver Assistance Systems) 장착 자동차의 DTG(Digital Tacho Graph), EDR(Event Data Recorder), VDR(Video Data Recorder), 텔레매틱스 정보(Telematics) 등의 기록데이터를 기반으로 차선 변경, 차선 유지 실패, 정차한 차량 추돌 사고를 분석하고 자율차량 사고의 책임소재 규명과 정확한 사고원인 분석을 위해 필요한 기록 항목을 제시한다.

후기

본 논문은 행정안전부 주관 국립과학수사연구원 중장기과학수사감정기법연구개발(R&D)사업의 지원을 받아 수행한 연구임(NFS2023STR01)

* 국립과학수사연구원/연구관

** 국립과학수사연구원/연구사

*** 국립과학수사연구원/연구사

E-mail : vortex820@korea.kr

조작 실수로 위장한 고의 교통사고 사례분석

김송희* · 김종혁** · 이재형*** · 최지훈**** · 전우정*****

Case Study on the Intentional Accident Under the Disguise of Operating Mistake

Songhui Kim*, Jonghyuk Kim**, Jaehyeong Lee***, Jihoon Choi****, WooJeong Jeon*****

Key Words : EDR data(EDR 기록), Driver's behavior(운전자의 운전행태), Intentional traffic accident(고의사고), Disguise accident(위장사고)

ABSTRACT

We report a case study on the driver's intentionality or disguising possibility of accident under the traffic accident by oneself. The accident occurred when an AVANTE vehicle collided with a Mercedes-Benz(G55 AMG model) parked in reverse direction on the right side of 1-lane of one way road for unknown reasons, and then an AVANTE vehicle was inverted to left side after colliding a REZZO vehicle parked on the other side of the road. To analyze the accident, accident records, accident scene photos, impact part photos of the accident cars(AVANTE, Bentz, REZZO) and an AVANTE's EDR data were presented as evidence. According to accident records, this accident occurred at around 1 a.m. in one way road in front of an apartment complex where streetlights were on, and multiple vehicles were parked in a row on both sides of the road. Additionally, the Bentz driver purchased for approximately 70 million won without repairing it a few month before accident, and the AVANTE driver claimed that they had no personal connection with the Bentz driver.

To analyze the cause of the accidents, an on site appraisal was conducted, and the driving state of the AVANTE vehicle was reconstructed using the AVANTE's EDR data and collision analysis program PC-Crash 12.1. By comparing the unique points of the damage form of the accident vehicles, it was confirmed regarding the intentionality or disguising possibility of the AVANTE driver.

* 국립과학수사연구원/공업연구소

** 국립과학수사연구원/공업연구소

*** 국립과학수사연구원/공업연구소

**** 국립과학수사연구원/공업연구소

***** 국립과학수사연구원/공업연구소

E-mail : songhkim907@korea.kr

가속케이블 손상에 의한 사륜오토바이의 급가속 사고 사례 분석

윤석현* · 황선준**

A Case Study of Rapid Acceleration Accidents of Quad Bikes Caused by Damage to Accelerator Cable

Seok-Hyun Yoon*, Sun-Joon Hwang**

Key Words : Traffic accident(교통사고), Quad bikes(사륜 오토바이), Accelerator cables(가속 케이블)

ABSTRACT

Traffic accidents can be caused by a variety of factors, including human error, vehicle defects, and environmental conditions. In October 2022, a quad bike crashed while traveling down a slope at Raon campsite due to a combination of human and vehicle factors. Specifically, the accelerator cable was broken and repaired with black insulating tape, but the cable remained pulled, preventing the quad bike from starting with battery power. The driver attempted to start the engine using the rotational force of the drive wheels while traveling down the slope. According to the driver, the quad bike suddenly accelerated forward as soon as the engine started. If the accelerator cable had been properly repaired or if the driver had recognized the danger of starting the engine while traveling downhill, the accident could have been prevented. This incident demonstrates that minor risks, if overlooked, can lead to major accidents.

* 국립과학수사연구원/실장

** 국립과학수사연구원/감정관

E-mail : jangdooyoon@naver.com

공유 전동 킥 스쿠터 주행 중 셧다운으로 인한 사고 사례 분석

이연섭* · 박정만** · 박정우* · 조건우*** · 전우정****

Accident Case Caused by Sudden Shutdown of Shared Electric Kick Scooter

Yeonsub Lee*, Jeongman Park**, Jungwoo Park*, Keonwoo Joh***, Woojeong Jeon****

Key Words : PM;Personal mobility(개인형 이동수단), Electric kickscoter(전동 킥스쿠터), Sudden shutdown(급정전), Accident(교통사고), Rental(공유)

ABSTRACT

Since 2010, the development of Personal Mobility (PM) has led to the emergence of various means of transportation, including electric skateboards, electric bicycles, and electric kick scooters with a maximum speed of 25km/h. The proliferation and increased usage of PMs have impacted not only greenhouse gas reduction but also social driving culture. Consequently, public or commercial shared PMs have emerged, resulting in a gradual increase in their usage, particularly with the added convenience of smartphone applications for easy rental and return.

Among these PMs, electric kick scooters have gained popularity due to the active promotion of sharing programs, resulting in a rapid increase in usage and a surge in accidents since 2019. Although electric kick scooters have the advantage of being easy to ride and convenient, they also have many safety concerns, such as vulnerability to rough terrain and the need to be cautious. Furthermore, many issues have been raised regarding careless driving and risky driving practices that cause accidents.

This case report focuses on an accident that occurred during the process of riding a shared electric kick scooter, rather than just the usual electric kick scooter riders. The accident involved a person illegally using a shared electric kick scooter that had been abnormally returned due to a shutdown during operation. Through this case, we aim to suggest improvements for safety concerns and functional issues that need to be addressed when using shared electric kick scooters

* 국립과학수사연구원 교통과/공업연구사

** 서울과학수사연구소 이공학과/공업연구사

*** 국립과학수사연구원 교통과/공업연구관

**** 국립과학수사연구원 교통과/과장

E-mail : gmsn54@korea.kr