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RESEARCH REPORT

Unsettled Issues on Sensor Calibration for Automotive Aftermarket Advanced Driver-Assistance Systems

John Waraniak

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About the Editor

John Waraniak has been in the aerospace, automotive, racing, and performance industries for over 25 years with wide-ranging systems engineering experience, innovative technology insights, and frontline lessons for competing and winning in today's Automotive 5.0 transformation. John was elected as an SAE Fellow in October 2019 for his significant technical achievements and mobility industry contributions in both automotive and aerospace.

John is currently CEO and co-founder of Have Blue, a proof-of-concept and technology demonstrator company and Executive Producer at the digital industrial firm Hackrod Studio MFG. He most recently served as Vice President of Vehicle Technology for the Specialty Equipment Market Association (SEMA) from May 2006 to January 2021. During his 15-year tenure, Waraniak was responsible for helping performance aftermarket companies integrate their products with the latest technologies and capitalize on new business and product-development opportunities. In addition, he developed the *customize-with-confidence*™ strategy by connecting aftermarket manufacturers with engineering resources, capabilities, and tools to manage disruptive vehicle technologies and ensure compliance with the latest industry standards and manufacturer best practices.

He is an acknowledged progressive strategist, technology program leader, and advocate for automaker-aftermarket-technology innovation and collaboration for advancing safety performance; electrification; connected, assisted, and automated driving; new mobility solutions; generative design; and vehicle systems engineering management.

He has held executive management positions at General Motors, Hughes Aircraft, Northrop, and No Fear. He is Chairman and Founding Member of the SAE Connect2Car Executive Leadership Committee, Board Advisor for the Indy Autonomous Challenge, King of the Hammers Electric Vehicle Challenge, and member of the Carroll A. Campbell Jr. Graduate Engineering Center External Advisory Board at Clemson University.

Waraniak was an original Member of Senior Ice, Tacit Blue, and Have Blue Classified Operations and Programs to design and develop the Northrop B2 Advanced Technology Stealth Bomber from 1980 to 1986. Born and raised in the Motor City of Detroit, John is an avid auto industry and motocross enthusiast. He is a graduate of the University of Michigan, the University of Illinois, and California Institute of Technology's Executive Engineering Management Program.

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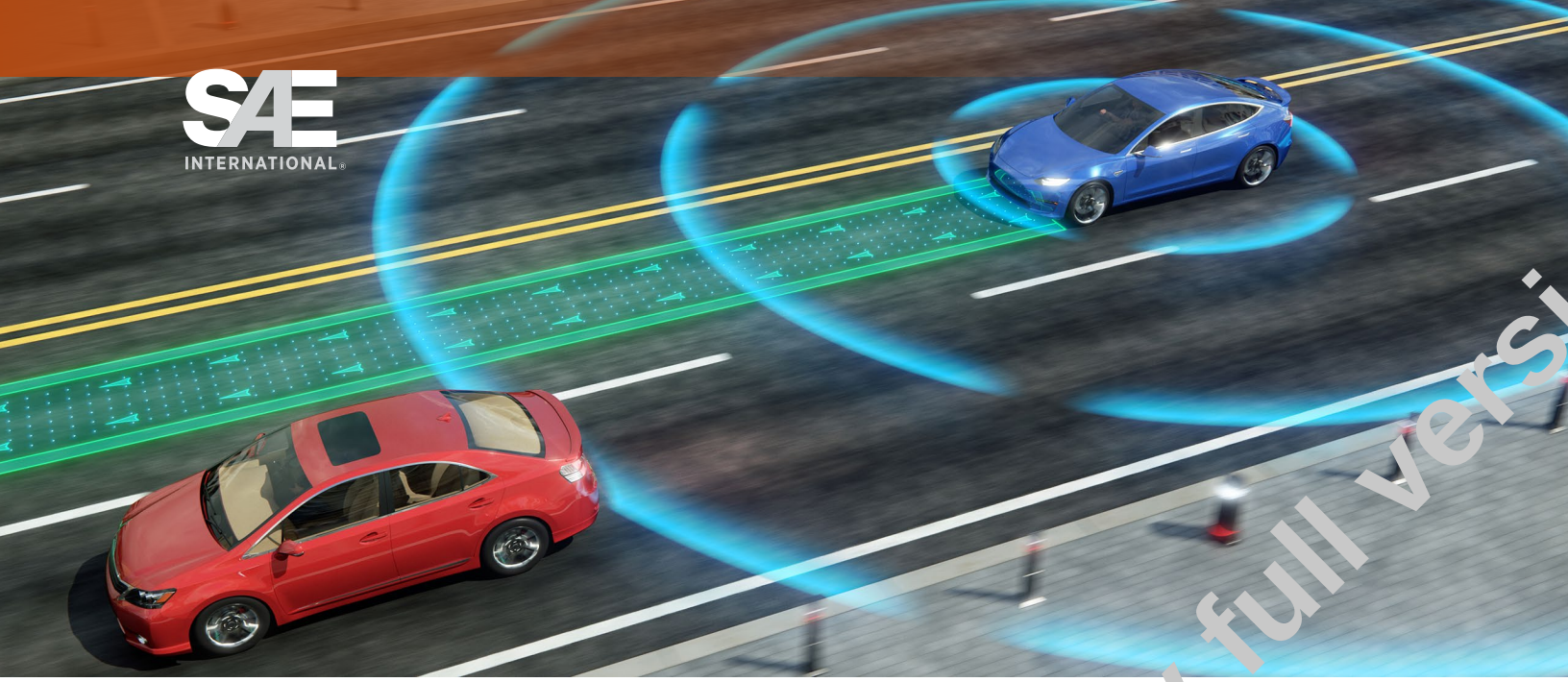

Unsettled Issues on Sensor Calibration for Automotive Aftermarket Advanced Driver-Assistance Systems

Abstract

Many automotive industry safety advocates have been pushing for greater market penetration of active safety and advanced driver-assistance systems (ADAS), with the goal of zero deaths due to transportation crashes. There are far-reaching implications for the collision repair, specialty equipment, and performance aftermarket sectors. After a collision or modification, the ADAS functionality must be preserved to maintain, driver, passenger, and road user safety.

To do this, sensor recalibration and ADAS functional safety validation and documentation after repair, modification, or accessorizing are necessary. However, the accelerating pace of ADAS technology additions to vehicles; a general industry lack of understanding of the systems, sensors, software, controllers, and other components; an overwhelming variety of sensor calibration procedures and automaker targets; and—finally—liability concerns are challenging the industry as it seeks to move forward safely. These are all unsettled topics that demand attention and standardization to support the safety and reliability of automated vehicles.

NOTE: SAE EDGE Research Reports are intended to identify and illuminate key issues in emerging, but still unsettled, technologies of interest to the mobility industry. The goal of SAE EDGE Research Reports is to stimulate discussion and work in the hope of promoting and speeding the resolution of identified issues. These reports are not intended to resolve the challenges they identify or close any topic to further scrutiny.

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