

Unsettled Technology Areas in Autonomous Vehicle Test and Validation

Dr. Rahul Razdan

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About the Series Editor



Dr. Rahul Razdan is senior director of special projects at Florida Polytechnic University in Lakeland, Florida. In this role, he serves as advisor to the president of the university and helps to manage the Advanced Mobility Institute, an applied research center for the development and testing of autonomous vehicle-related technology. Named on more than 24 issued patents, Razdan earned a Doctorate (Ph.D.) in Computer Science from Harvard University and both a Master of Science in Computer Engineering and a Bachelor of Science in Electrical and Computer Engineering from Carnegie Mellon University.

Razdan boasts 35 years of experience in startups, academic, and Fortune 500 companies working in such areas as science, technology, engineering, and mathematics (STEM) education; autonomous vehicle technology; and semiconductor design. The Association for Computing Machinery (ACM) and the Institute of Electrical and Electronics Engineers (IEEE) have recognized him with “Hall of Fame” inductions. Razdan has also won numerous best-paper awards and has led several successful startups, such as electronic design automation (EDA), wireless power, artificial intelligence (AI), and machine learning (ML).

contents

About the Series Editor

Unsettled Technology Areas in

Autonomous Vehicle Test and Validation 3

Introduction 4

- Economic Drivers for Autonomous Vehicle Technology* 4
- State of the Industry* 4

Replacing the Driver 6

- Recommendations* 7

Regulations 7

- Recommendations* 8

Finessing Existing Validation Approaches to Fit New ADS Paradigm 9

- Test Tracks: Advantages and Disadvantages* 10
- Real-World Driving: Advantages and Disadvantages* 10
- Video and Image Datasets: Advantages and Disadvantages* 14
- Modeling and Simulation: Advantages and Disadvantages* 14
- Recommendations* 5

Hardware Validation and Natural

Language Processing 17

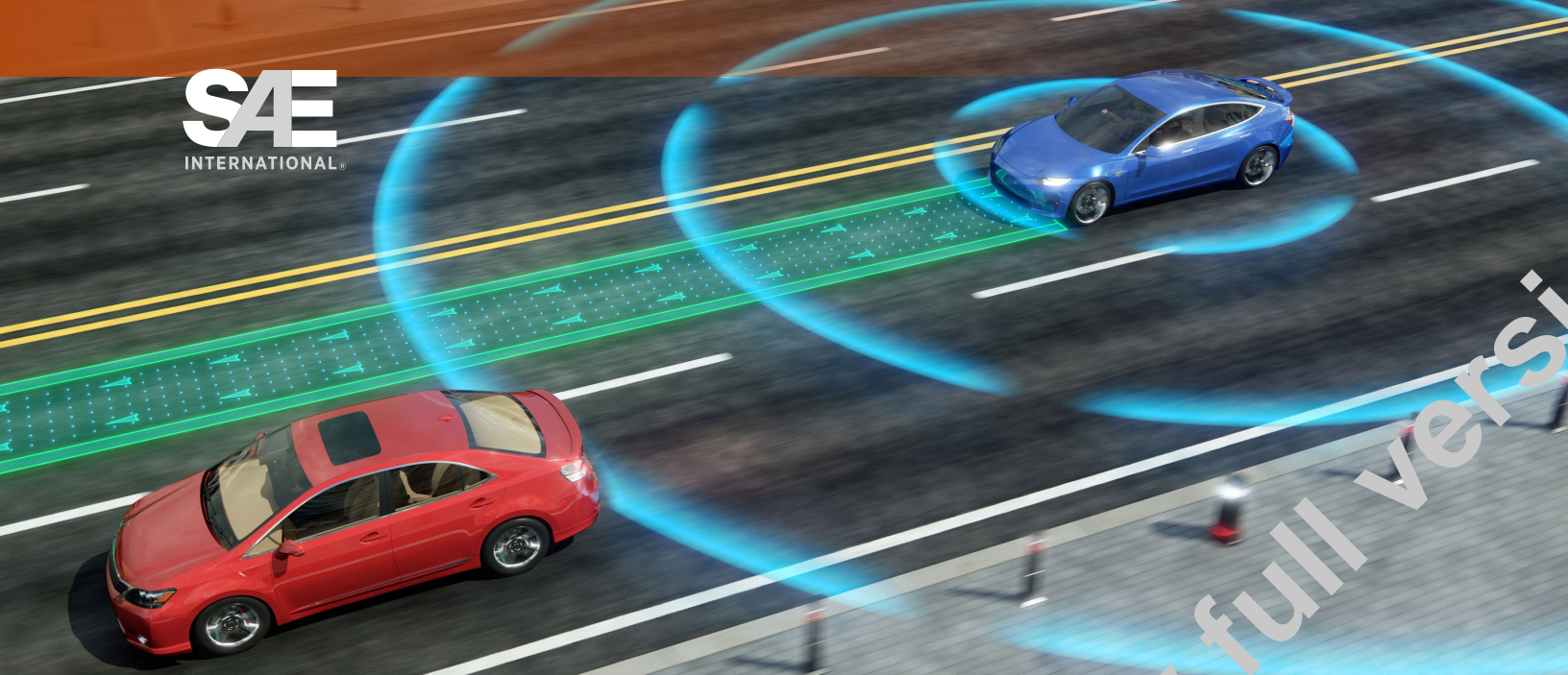
- Similar Challenges from a Different Field: Hardware Validation and Natural Language Processing* 17
- Mapping Hardware Validation Solutions to Autonomous Vehicles* 18
- Recommendations* 18

Progressive Structures: Evolving Requirements to Ensure Future Safety 18

- Original Equipment Manufacturers (OEMs)* 19
- Validation Services Providers* 19
- Standardization Bodies and Regulators* 20
- Recommendations* 20

Summary/Conclusions 20

- Next Steps for Autonomous Vehicle Test and Validation* 20
- Recommendations* 21
- SAE EDGE™ Research Reports* 21
- Abbreviations/Definitions* 21
- Works Cited* 22
- Contact Information* 27



Unsettled Technology Areas in Autonomous Vehicle Test and Validation

Abstract

Automated driving system (ADS) technology and ADS-enabled/operated vehicles - commonly referred to as automated vehicles and autonomous vehicles (AVs) - have the potential to impact the world as significantly as the internal combustion engine. Successful ADS technologies could fundamentally transform the automotive industry, civil planning, the energy sector, and more.

Rapid progress is being made in artificial intelligence (AI), which sits at the core of and forms the basis of ADS platforms. Consequently, autonomous capabilities such as those afforded by advanced driver assistance systems (ADAS) and other automation solutions are increasingly becoming available in the marketplace. To achieve highly or fully automated or autonomous capabilities, a major leap forward in the validation of these ADS technologies is required. Without this critical cog, helping to ensure the safety and reliability of these systems and platforms, the full capabilities of ADS technology will not be realized.

This paper explores the ADS validation challenge by reviewing existing approaches and examining the effectiveness of those approaches, presenting critical techniques required to bring safe and effective solutions to market, discussing unsettled topics, and suggesting next steps for industry stakeholders to consider as they work to advance the ADS ecosystem.

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 resolution of identified issues. SAE EDGE™ Research Reports are not intended to resolve the issues they identify or close any topic to further scrutiny.

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