

**Unsettled Issues in  
Determining Appropriate  
Modeling Fidelity for  
Automated Driving  
Systems Simulation**

Sven Beiker, PhD

# Unsettled Issues in Determining Appropriate Modeling Fidelity for Automated Driving Systems Simulation

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## About the Editor



**Sven Beiker, PhD**, is the Founder and Managing Director of Silicon Valley Mobility, a mobility consulting and advisory firm that specializes in technical diligence, product roadmaps, and business models for mobility topics. The engagements span startups, investors, and corporations in the mobility and adjacent industries. In addition, Dr. Beiker is a lecturer at the Graduate School of Business at Stanford University where he instructs students on strategies for startups and corporations in the field of automated, connected, electrified, and shared mobility.

With his well over 20 years of experience gained during his tenure at McKinsey & Company, Stanford University, and the BMW Group, Dr. Beiker is dedicated to the future of the automobile and personal mobility. His mission is to improve sustainability, safety, efficiency, and convenience in how consumers use automobiles. He combines perspectives from technology, business, policy, and human factors.

Dr. Beiker also serves in advisory boards of several startups in the mobility space, as an advisor to the German American Chamber of Commerce in San Francisco, and as an advisor/co-editor to the Lecture Notes in Mobility of Springer Science+Business Media. He is a continuing contributor to the SAE EDGE™ Research Report series.

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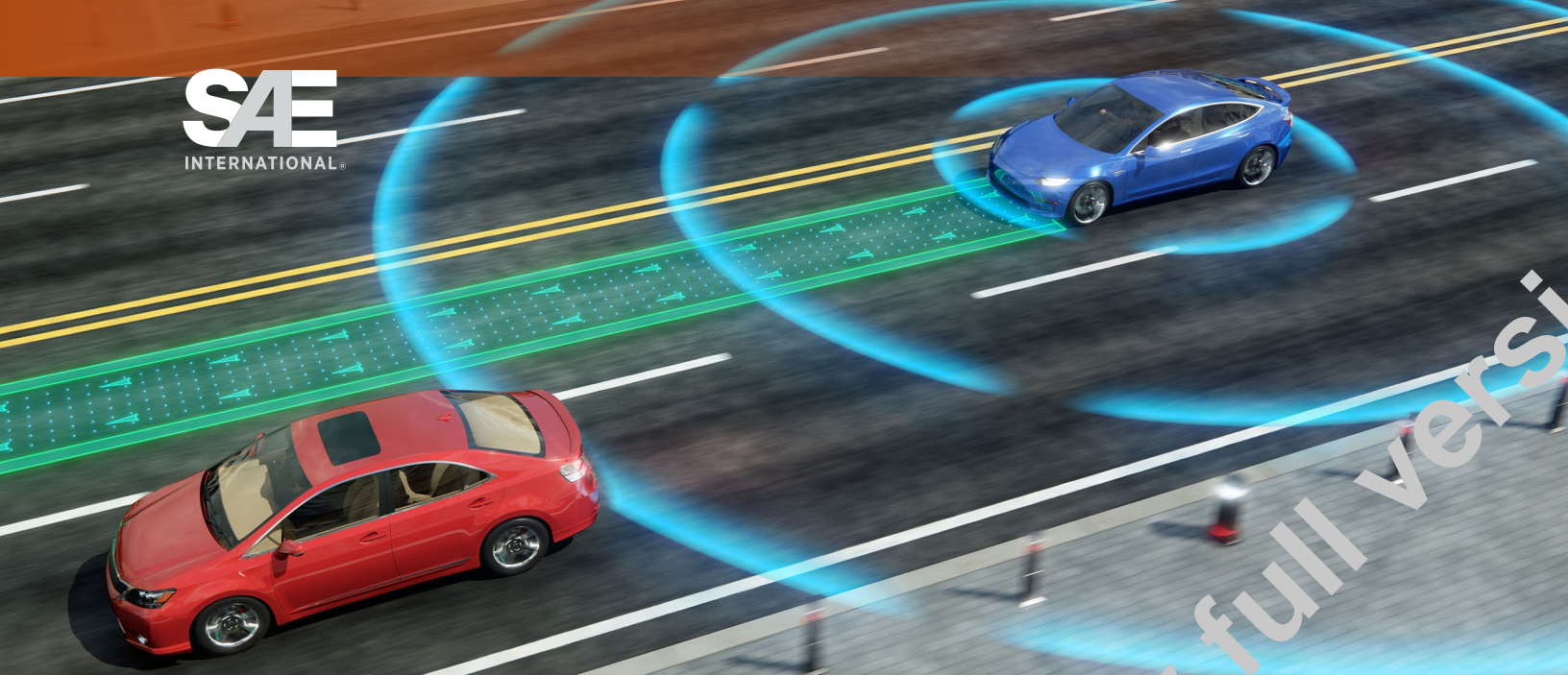
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# Unsettled Issues in Determining Appropriate Modeling Fidelity for Automated Driving Systems Simulation

## Abstract

This SAE EDGE™ Research Report identifies key unsettled issues of interest to the automotive industry regarding the challenges of achieving optimal model fidelity for developing, validating, and verifying vehicles capable of automated driving. Three main issues are outlined that merit immediate interest:

- First, assuring that simulation models represent their real-world counterparts, how to quantify simulation model fidelity, and how to assess system risk.
- Second, developing a universal simulation model interface and language for verifying, simulating, and calibrating automated driving sensors.
- Third, characterizing and determining the different requirements for sensor, vehicle, environment, and human driver models.

SAE EDGE™ Research Reports are preliminary investigations of new technologies. The three technical issues identified in this report need to be discussed in greater depth with the aims of, first, clarifying the scope of the industry-wide alignment needed; second, prioritizing the issues requiring resolution; and, third, creating a plan to generate the necessary frameworks, practices, and protocols.

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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