SAE INTERNATIONAL

SAE EDGE™
RESEARCH REPORT

Unsettled Topics Concerning User Experience and Acceptance of Automated Vehicles

Amine Taleb-Bendiab, Ph.D.

SAE EDGE™
RESEARCH REPORT

Unsettled Topics Concerning User Experience and Acceptance of Automated Vehicles

Amine Taleb-Bendiab, Ph.D.
Valeo North America, Inc.

EDGE DEVELOPMENT TEAM

Greg Brannon, *AAA*
Nicolas De Crémiers, *Navya*
Alex Epstein, *National Safety Council*
Rachel Forestier, *Valeo*
David Hofert, *Perrone Robotics*
Katharina Hottelart, *Valeo*
Kristin Kolodge, *J.D. Power*
Sheldon Russell, Ph.D.,
Virginia Tech Transportation Institute

SAE INTERNATIONAL®
Warrendale, Pennsylvania, USA

About the Publisher

SAE International® is a global association of more than 128,000 engineers and related technical experts in the aerospace, automotive, and commercial-vehicle industries. Our core competencies are lifelong learning and voluntary consensus standards development. Visit sae.org

SAE EDGE™ Research Report Disclaimer

SAE EDGE™ Research Reports focus on topics that are dynamic, in which knowledge is incomplete, and which have yet to be standardized. They represent the collective wisdom of a group of experts and serve as a practical guide to the reader in understanding an unsettled subject matter. They are not meant to provide a recommended practice or protocol. The experts have assembled as a community of practitioners to contribute and collectivize their thoughts and points of view; these are not the positions of the institutions or businesses with which they are affiliated nor one contributor's perspective advanced over other contributors. SAE EDGE™ Research Reports are the property of SAE International, and SAE alone is responsible for their content.

About This Publication

SAE EDGE™ Research Reports provide state-of-the-art and state-of-the-industry examinations of the most significant topics in mobility engineering. SAE EDGE™ contributors are experts from research, academia, and industry who have come together to explore and define the most critical advancements, challenges, and future direction in areas such as vehicle automation, unmanned aircraft, cybersecurity, advanced propulsion, advanced manufacturing, Internet of Things, and connectivity.

Related Resources

SAE MOBILUS® Automated & Connected Knowledge Hub
https://saemobilus.sae.org/automated-connected/

SAE Team

Frank Menchaca, Chief Growth Officer
Michael Thompson, Director, Standards, Information and Research Publications
Monica Nogueira, Director of Content Acquisition
Beth Ellen Dibeler, Product Manager
William Kucinski, Managing Technical Editor

EPR2020012
ISSN 2640-3536
e-ISSN 2640-3544
ISBN 978-1-4686-0187-9

To purchase bulk quantities, please contact: SAE Customer Service

E-mail: CustomerService@sae.org
Phone: 877-606-7323 (*inside USA and Canada*)
+1-724-776-4970 (*outside USA*)
Fax: +1-724-776-0790

https://www.sae.org/publications/edge-research-reports

About the Editor

Amine Taleb-Bendiab, Ph.D. is the Research and Development Director for Valeo's Comfort and Driving Assistance (CDA) Business Group in North America. In this role, he leads the engineering organization in three focus areas of Valeo Intuitive Driving: Automated Driving and Parking, Connected Car, and Intuitive Controls - for the North American market. Author of several technical papers in leading industry and academic publications, Dr. Taleb-Bendiab earned his doctorate in Physical Chemistry from the University of Michigan, with focus in spectroscopy techniques.

Prior to joining Valeo's CDA Business Group, Dr. Taleb-Bendiab held several technical leadership positions at various automotive innovation suppliers in the area of active safety, advanced lighting, smart sensing devices, LED, and laser products. Prior to working in automotive, he worked in start-up and government research lab institutions. He builds on more than 25 years' experience in cutting-edge technologies.

Dr. Taleb-Bendiab is a 21-year member of SAE International and is Valeo's representative to the Automotive Information Sharing and Analysis Center (Auto-ISAC) advisory board. He has participated as an invited speaker and panelist on automated driving and user experience and has contributed as SAE technical paper reviewer around advanced driver assistance systems, human-machine interface, and smart sensing topics.

contents

metamorworks/Shutterstock.com

Unsettled Topics Concerning User Experience and Acceptance of Automated Vehicles

Abstract

Driver assistance and low-level automation are creating a pathway of experience and projected acceptance toward higher automation levels when there is a positive experience and consumers see value in the technology. Automated vehicles will provide new opportunities for how consumers spend their time as the driver role evolves with higher levels of automation. However, the basics must still be met - safety and reliability, along with comfort and convenience - in order to gain consumer trust.

This SAE EDGE™ Research Report aims at addressing the unsettled topic of user acceptance of automated driving and analyzing the user experience for a more intuitive and safe driving experience. First, we examine the requirements for safer driver/user engagement with driving for the various SAE automation levels. This is based on learnings from various recent qualitative and quantitative studies. Second, we analyze consumer sentiment toward automated driving - both consumer excitement about the perceived benefits and dislikes or concerns about the technology. In addition, we touch upon the findings from surveys about drivers' experience with advanced driving assistance technologies and how it applies to automated driving. Third, we highlight driver profiles observed during a user-centric experience in an immersive automated driving cockpit. As a result, we proposed - through a trust pyramid representation - a means of gradually increasing user trust through careful human-machine interface (HMI) delivery with appropriate levels of information that communicate safe driving. Ultimately, the goal is to build up user confidence in safe automated driving so that their time can be spent on entertainment or other non-driving tasks.

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 challenges they identify or close any topic to further scrutiny.

AMINE TALEB-BENDIAB, Ph.D.
Valeo North America, Inc.

Edge Development Team

Greg Brannon, *AAA*
Nicolas De Crémiers, *Navya*
Alex Epstein, *National Safety Council*
Rachel Forestier, *Valeo*
David Hofert, *Perrone Robotics*
Katharina Hottelart, *Valeo*
Kristin Kolodge, *J.D. Power*
Sheldon Russell, Ph.D.,
Virginia Tech Transportation Institute

ISSN 2640-3536