

Preface

You are holding the fourth volume of the Road Vehicle Automation book series in your hands, a journey that started when one of the very first symposia on this topic was held at Stanford University in 2013. Back then, an evolutionary development path, building on and further extending the achievements in advanced driver assistance systems, appeared to be the most probable introduction scenario of highly automated driving. Level 3 automation seemed to be feasible in the less complex environment of a motorway, as it would require just vehicle-based sensor systems, whereas the more revolutionary path of level 4 and 5 automation, covering a whole trip including urban areas, was considered pure utopia.

This notion is beginning to change fundamentally, right now. It is becoming obvious that level 3 automation would mean quite a lot of handovers from manual to automated driving and vice versa with uncertainties about driver's attention. At the same time, solutions for interpretation of traffic scenes improve, e.g., combining and fusing information from multiple sensor systems—both in the car and the environment, pattern recognition using machine learning and big data analysis, and connectivity of the vehicle with others and the infrastructure. In fact, it is uncertain now, which of the two paths—evolutionary or revolutionary—will unfold sooner. What remains certain, though, is the need to further develop technologies, study human factors, harmonize legal frameworks, and—last but not least—to validate the safety of automated and connected driving at all levels.

The chapters of this book are comprehensively covering political, legal, human factors, business, and technology-related aspects of connected and automated driving. They are based on oral and poster presentations of the Automated Vehicles Symposium (AVS) 2016 in San Francisco, California (USA). We are extremely grateful for these contributions and particularly appreciate the efforts of breakout session organizers to summarize the discussions they chaired in additional, jointly authored papers. Furthermore, we are happy to note that some authors who had contributed to previous volumes of Road Vehicle Automation have written chapters again. This provides the researchers, engineers, and decision-makers who are reading this book the opportunity to follow the developments in this rapidly evolving field in a unique way.

It should be noted that the Road Vehicle Automation books are now considered an important and relevant reference in their field. The chapters of the first three volumes have been downloaded more than 100 thousand times in the meanwhile, and access to the books is provided by several hundreds of libraries on all continents.

We would like to thank the organizers of the AVS 2016, the Transportation Research Board (TRB) and the Association for Unmanned Vehicle Systems International (AUVSI), for the continuing partnership. Our particular thanks go to Jane Lappin, Steve Shladover, and Bob Denaro from TRB for their support. Last but not least, we would like to thank Jan-Philip Schmidt and Petra Jantzen from Springer and Diana Tobias from VDI/VDE-IT for all their help during the editorial process.

And of course we are looking forward to the Automated Vehicle Symposium 2017 in San Francisco to connect with the automated driving community again, exchange latest findings in the field, and plan the fifth volume of this series as the next step in documenting what is arguably the greatest transition the automobile has seen since its invention more than 125 years ago.

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