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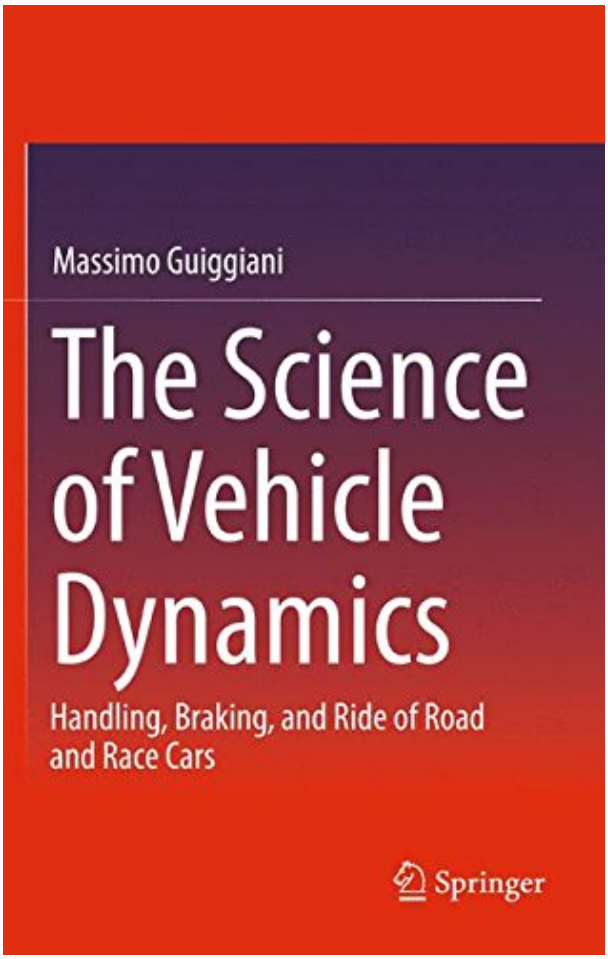

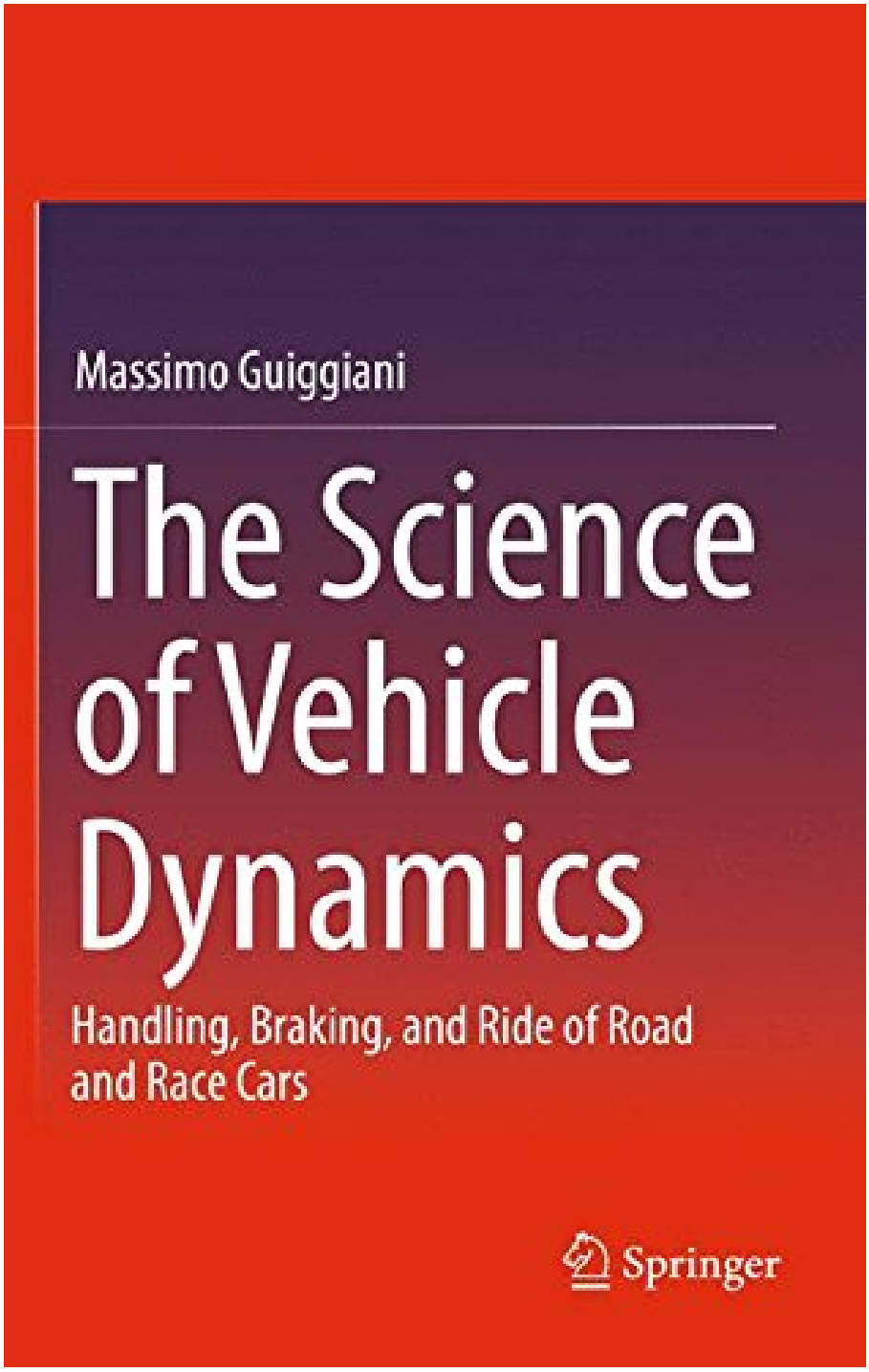

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Review

From the book reviews:

“The book is a very thorough and painstakingly developed dynamic analysis of components, assemblies, vehicles, and their design to provide optimal handling, cornering, braking, comfort and road holding. … The Science of Vehicle Dynamics serves as a good textbook for automotive engineering students and a good reference for automotive engineers.” (Jon W. Mooney, Noise Control Engineering Journal, Vol. 62 (3), May-June, 2014)

From the Author
This book is not the translation of the Italian book "Dinamica del Veicolo". Actually, in some sense, this new book is totally different, with new topics and with new points of view for the topics covered in the Italian book as well.

Highlights:
1. Neat definition of tire pure rolling: p. 28;
2. No-roll centers and no-roll axis: p. 75;
3. Lateral load transfers including tire vertical stiffness: p. 81;
4. Principles of any differential mechanism: p. 90;
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9. Relationship between steady-state data and transient behavior: pp. 175-179;
10. New understeer gradient: pp. 179-186;
11. Handling of race cars: Chapter 7;

12. Handling surface (not diagram): pp. 210-225;
13. New powerful and intuitive handling approach called MAP: pp. 225-233;
14. Neat discussion of the inerter: pp. 243 and 251;
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16. Neat tire brush model: Chapter 10;
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From the Back Cover

Vehicle dynamics is often perceived as a quite intuitive subject. As a matter of fact, lots of people are able to drive a car. Nevertheless, without a rigorous mathematical formulation it is very difficult to truly understand the physical phenomena involved in the motion of a road vehicle.

In this book, mathematical models of vehicles are developed, always paying attention to state the relevant assumptions and to provide explanations for each step. This approach allows for a deep, yet simple, analysis of the dynamics of vehicles, without having to resort to foggy concepts. The reader will soon achieve a clear understanding of the subject, which will be of great help both in dealing with the challenges of designing and testing new vehicles and in tackling new research topics.

The book covers handling and performance of both road and race cars. A new approach, called MAP (Map of Achievable Performance), is presented and thoroughly discussed. It provides a global and intuitive picture of the handling features of a vehicle. Moreover, the book also deals with several relevant topics in vehicle dynamics that have never been discussed before.

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Author's website with interactive figures (dimnp.unipi.it/guiggiani-m)
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Most helpful customer reviews

1 of 1 people found the following review helpful.
This book is by far the best text available on the topic
By Amazon Customer
This book is by far the best text available on the topic. Professor Guiggiani has written a book that is based firmly in classical mechanics, and in so doing, dispels many of the concepts and terms that can be confusing and misleading in the field of vehicle dynamics.
Vehicle dynamics can be considered to be the study of rigid body kinematics and dynamics. Yet, many of the

concepts (roll center) and the terminologies are inaccurate and therefore confusing. There is nothing different or special about the study of the motions of a vehicle under applied forces and moments, and it seems much of the lack of understanding comes from the fact that tires are highly non-linear force-producing devices. Fortunately, Professor Guiggiani addresses even this topic with ease and great clarity.
This is the only text I have seen which addresses the kinematics of vehicle cornering using the concept of the inflection circle, and other concepts borrowed from planar analysis. I feel very strongly that this approach will lead to a much greater understanding of the kinematics of both road and race cars then is currently applied in the respective industries.
I can't recommend this text highly enough; if you have an interest in understanding the dynamics of road and/or race vehicles, there is no better resource available. Enjoy.

2 of 2 people found the following review helpful.
The best text of vehicle dynamics on the market
By Andrease
The best book of vehicle dynamics I encontered so far.
The author introduces some quite innovative concepts like the vehicle invariant point, the track inveriant point, the map of achievable performance together with a rigorous analysis of the kinematics of cornering.
Also the most classical concepts are rediscussed, like the handling diagram, the single track model and the roll axis: the review is carried out however keeping a critical eye and without giving anything for granted.
The typical aspect of handling, braking and ride behavior of racing cars are also analyzed pointing out the main differences with respect to road cars.
A state-of-the-art model of wheel with tire is presented in the last chapter, together with new and innovative concepts like "the tire action surface".
A MUST READ FOR CURIOUS STUDENTS AND AUTOMOTIVE ENGINEERS

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Hands down the best Vehicle Dynamics book I have ever read
By luisito
Hands down the best Vehicle Dynamics book I have ever read. I am currently writing my Master's Thesis on a Fully Autonomous Vehicle Cruise Control System and this book has given me a greater understanding of Vehicle Dynamics, all I know in that area I owe it to the author. My focus is Control Systems Engineering and had never taken a class on Vehicle Dynamics. If you have previously studied Kinematics and Dynamics, then this book should be extremely easy to follow and understand. I have read many books on Vehicle Dynamics, and this book excels in its area. After reading the book I had some curiosity about whom the author was, because of the excellent material quality; I wasn't surprised by the amazing experience and credentials of Dr. Guiggiani.

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