



Combine Harvesters: Theory, Modeling, and Design

By Petre Miu

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Combine Harvesters: Theory, Modeling, and Design By Petre Miu

From Basic Fundamentals to Advanced Design Applications

A culmination of the author's more than 20 years of research efforts, academic papers, and lecture notes, **Combine Harvesters: Theory, Modeling, and Design** outlines the key concepts of combine harvester process theory and provides you with a complete and thorough understanding of combine harvester processes. Utilizing a wealth of experimental data to promote validated mathematical models, this book presents the latest stochastic and deterministic modeling methods, evolutionary computational techniques, and practical applications.

Highly focused on engineering and mathematics, it incorporates the use of simulation software (including MATLAB®) throughout the text and introduces a unified approach that can be used for any combine harvester functional structure. The book addresses modeling, simulation, evolutionary optimization, and combine process design. Breadth of coverage includes general technical specifications, developing machine layout as defined by engineering calculations, and design considerations for major subassembly processes.

Comprised of 15 chapters, this text:

- Provides examples of current combine systems/elements design throughout the book

- Incorporates applications/exercises inspired by the author's engineering and research experience
- Uses both SI (metric) and imperial/U.S. measuring units throughout

Combine Harvesters: Theory, Modeling, and Design contains principles, calculations, and examples that can aid you in combine process modeling and simulation, the development of combine process and driving task-based control systems by considering a top-to-bottom design of combine assembly and components.

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Combine Harvesters: Theory, Modeling, and Design By Petre Miu Bibliography

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Editorial Review

Review

"Despite the vital importance of combine harvesters, there has been surprisingly little published recently on their engineering. This book has admirably filled that gaping void. It can be understood by good undergraduates, yet has sufficient technical strengths and details to please graduate students and practicing engineers. The latest theoretical and practical concepts are thoroughly explained with ample and excellent figures and clear writing. I highly recommend it to anyone interested in combine harvesters.

?John K. Schueller, University of Florida, Gainesville, USA

"This book takes a logical and well-structured approach to presenting a[n] understanding of the design criteria and limitations in the development of a combine harvester. The clearly laid out mathematical principles underlying the theory of operation of a combine make it easy for the reader to follow the process."

?Dr. Kevin McDonnell, University College Dublin, Ireland

"The unitary approach taken in this book which links historical perspective and functional aspects into the classical engineering approach renders itself very well. It is encouraging to note the depth of engineering, mathematics, and other multi-disciplinary aspects in the book. The author has systematically considered all the material properties essential in the design."

?Dr. Vijaya Raghavan, McGill University, Quebec, Canada

"In my opinion, nothing available is really comparable to this book of Petre Miu."

?Dr. Ludger Frerichs, Technical University Braunschweig, Germany

"A broad overview of combine technology today is provided on limited space. State-of-the-art sensors and diagnostic systems are presented including fundamental physical principles and equations. The focus is on the basic understanding of current production combines. Many descriptive figures are used. The level of detail provided in the book is not enough to design a combine, but it gives a fundamental understanding of various combine functions and subsystems."

?Dr. Folker Beck, Deere & Company

"This book contains detailed technical information including constructions and design calculations about a combine. Each working system in a combine was discussed in one chapter that is convenient for readers to use this book as a design reference book. It can be a good reference book for college students and researchers who are working on combine harvester design and test."

?Jude Liu, Associate Professor of Agricultural and Biological Engineering, The Pennsylvania State University

About the Author

Petre Miu is the owner of Projenics (www.projenics.net), Canada. He worked as a research associate at the Biosystems Engineering Department, University of Tennessee, Knoxville, and as a professor at the Politehnica University of Bucharest, Romania. Dr. Miu began his most prolific and prestigious scientific work in Stuttgart, Germany, at Hohenheim University, Institute of Agricultural Engineering, where the

German government awarded him two consecutive postdoctoral Alexander von Humboldt research grants. He has extensive experience in the design of harvesting machinery and equipment, and in other areas, including computer numerical control machining centers, robotics, and electronic packaging of radio frequency radar systems.

Users Review

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Juan Reynolds:

As people who live in the modest era should be upgrade about what going on or data even knowledge to make all of them keep up with the era which can be always change and progress. Some of you maybe may update themselves by examining books. It is a good choice to suit your needs but the problems coming to a person is you don't know which you should start with. This Combine Harvesters: Theory, Modeling, and Design is our recommendation to cause you to keep up with the world. Why, because book serves what you want and want in this era.

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Jean Taylor:

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