DESCRIPTION

With this book as their guide, readers will discover how to design better protective equipment and devices such as helmets, seat belts, and wheelchairs in order to minimize the risk or the extent of injury to people subjected to impact loads. It is based on the theory of optimal shock isolation, first developed in the 1950s to protect missile systems from intensive shock loads.

Using examples from automotive, aviation, and military areas, the authors demonstrate how optimal shock isolation theory enables designers to improve the performance of protective equipment by incorporating control and optimization methods developed for shock isolation systems.

The first part of *Injury Biomechanics and Control* lays down the engineering foundation, setting forth core principles and techniques, including:

- Fundamentals of impact and shock isolation systems
- Basic optimal shock isolation for single-degree-of-freedom systems
- Optimal shock isolation for multi-degree-of-freedom systems
The second part applies the principles set forth in the first part to solve real-world problems, using simple mathematical models that simulate the mechanical response of human bodies to impact loads in order to optimize shock isolation systems. This book enables scientists, engineers, and students in mechanical, biomechanical, and biomedical engineering to fully realize the potential of shock isolation methods for the development of protective equipment and devices.

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The late Walter D. Pilkey, PhD, was the Morse Professor of Mechanical and Aerospace Engineering, with courtesy positions in Plastic Surgery and Neurosurgery at the University of Virginia. He received his BA, MS, and PhD from Washington State University, Purdue University, and Penn State University, respectively.

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