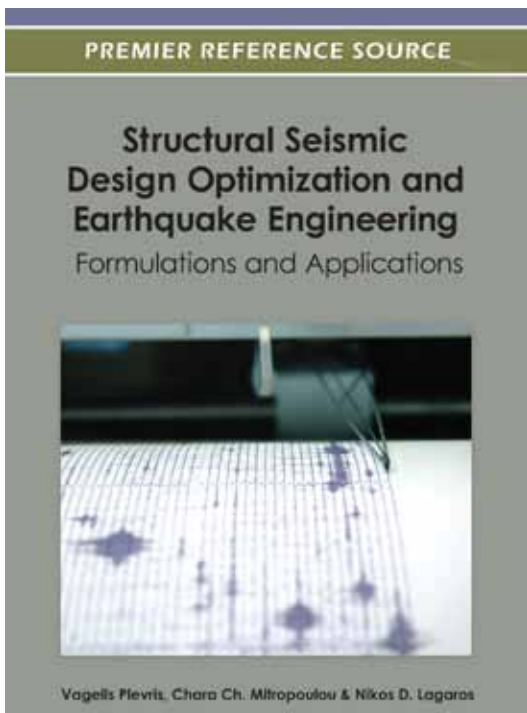


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## Structural Seismic Design Optimization and Earthquake Engineering: Formulations and Applications



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Throughout the past few years, there has been extensive research done on structural design in terms of optimization methods or problem formulation. &nbsp;But, much of this attention has been on the linear elastic structural behavior, under static loading condition. &nbsp;Such a focus has left researchers scratching their heads as it has led to vulnerable structural configurations. What researchers have left out of the equation is the element of seismic loading. It is essential for researchers to take this into account in order to develop earthquake resistant real-world structures.

**Structural Seismic Design Optimization and Earthquake Engineering: Formulations and Applications** focuses on the research around earthquake engineering, in particular, the field of implementation of optimization algorithms in earthquake engineering problems. Topics discussed within this book include, but are not limited to, simulation issues for the accurate prediction of the seismic response of structures, design optimization procedures, soft computing applications, and other important advancements in seismic analysis and design where optimization algorithms can be implemented. Readers will discover that this book provides relevant theoretical frameworks in order to enhance their learning on earthquake engineering as it deals with the latest research findings and their practical implementations, as well as new formulations and solutions.

### Topics Covered:

- Structural optimization
- Reliability based design optimization
- Robust design optimization
- Performance-based structural design
- Life cycle cost structural analysis
- Optimization algorithms
- Design optimization in earthquake engineering
- Optimal seismic performance-based design of structures

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**Dr. Vagelis Plevris** is an Assistant Professor at the Department of Civil and Structural Engineering Educators, School of Pedagogical & Technological Education (ASPETE) in Athens, Greece and a research associate at the School of Civil Engineering, National Technical University of Athens (NTUA). He holds a bachelor in Civil Engineering, an MSc in Earthquake Engineering, a PhD in Computational Mechanics from NTUA and also a Master in Business Administration from the Athens University of Economics and Business. His research work focuses mainly on computational earthquake engineering, design optimization, reliability analysis of structures and neural networks applications in structural engineering. His published research work includes more than 10 peer-reviewed journal papers, 4 contributed books as editor, 4 chapters in international scientific books and 22 papers in international conferences.



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