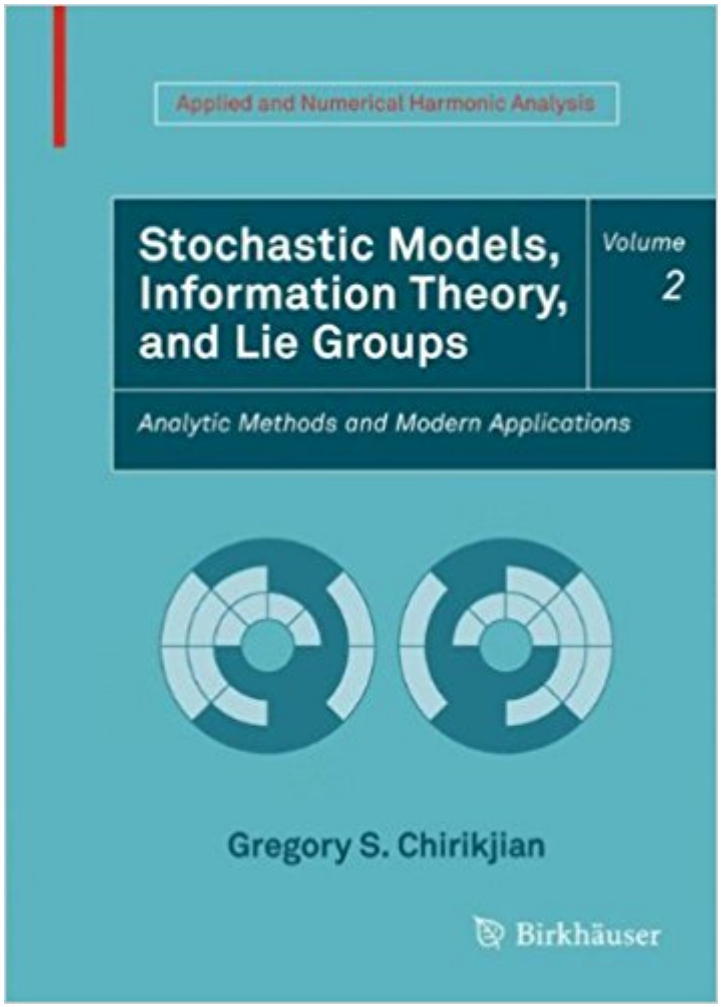
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# Stochastic Models, Information Theory, And Lie Groups, Volume 2: Analytic Methods And Modern Applications (Applied And Numerical Harmonic Analysis)




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## Synopsis

This unique two-volume set presents the subjects of stochastic processes, information theory, and Lie groups in a unified setting, thereby building bridges between fields that are rarely studied by the same people. Unlike the many excellent formal treatments available for each of these subjects individually, the emphasis in both of these volumes is on the use of stochastic, geometric, and group-theoretic concepts in the modeling of physical phenomena.Stochastic Models, Information Theory, and Lie Groups will be of interest to advanced undergraduate and graduate students, researchers, and practitioners working in applied mathematics, the physical sciences, and engineering. Extensive exercises, motivating examples, and real-world applicationsÃ Â make the work suitable as a textbook for use in courses that emphasize applied stochastic processes or differential geometry.

## Book Information

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The subjects of stochastic processes, information theory, and Lie groups are usually treated separately from each other. This unique two-volume set presents these topics in a unified setting, thereby building bridges between fields that are rarely studied by the same people. Unlike the many excellent formal treatments available for each of these subjects individually, the emphasis in both of these volumes is on the use of stochastic, geometric, and group-theoretic concepts in the modeling of physical phenomena.Volume 1 establishes the geometric and statistical foundations required to

understand the fundamentals of continuous-time stochastic processes, differential geometry, and the probabilistic foundations of information theory. Volume 2 delves deeper into relationships between these topics, including stochastic geometry, geometric aspects of the theory of communications and coding, multivariate statistical analysis, and error propagation on Lie groups.Key features and topics ofÃ Â Volume 2:* The author reviews the concept ofÃ¢â ¬â ¢andÃ Â functions and integration onÃ¢â ¬â ¢Lie groups with many concrete examples.* Extensive exercises and motivating examples make the work suitable as a textbook for use in courses that emphasize applied stochastic processes on Lie groups or geometric aspects of probability and statistics.*Ã Â Specific application areas are explored, including biomolecular statistical mechanics and information-driven motion in robotics.* The concrete presentation style makes it easy for readers to obtain numerical solutions for their own problems; the emphasis is on how to calculate quantities rather than how to prove theorems.* Modern problems at the interface of mechanics, control theory, and communications are handled in a unified framework and multiple directions for future research are explored.Stochastic Models, Information Theory, and Lie Groups will be of interest to advanced undergraduate and graduate students, researchers, and practitioners working in applied mathematics, the physical sciences, and engineering.

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