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Fractional processes are widely found in science, technology and engineering systems. In Fractional Processes and Fractional-order Signal Processing, some complex random signals, characterized by the presence of a heavy-tailed distribution or non-negligible dependence between distant observations (local and long memory), are introduced and examined from the 'fractional' perspective using simulation, fractional-order modeling and filtering and realization of fractional-order systems.

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The fractional-order system has been successfully used in many fields with characteristics such as "process memory" and "historical heredity" [1][2][3] [4] [5]. On the other hand, the singular ...

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Fractional processes, which can be considered as outputs of the fractional-order systems, have significant and complex long-memory properties. In order to best understand the fractional-order systems and extract valuable information from the fractional-order signals, fractional-order signal processing techniques are put forward for different kinds of fractional signals. All discussions on fractional-order signal processing techniques are centered around fractional calculus, fractional ...

Fractional Distillation: Fractional distillation is used to separate liquids with closer boiling points. Simple Distillation: Simple distillation is used to separate liquids with boiling point gaps of at least 50 degrees. Apparatus Fractional Distillation: Fractional distillation uses a complex apparatus with a fractionating column.

The book presents efficient numerical methods for simulation and analysis of physical processes exhibiting fractional order (FO) dynamics. The book introduces FO system identification method to estimate parameters of a mathematical model under consideration from experimental or simulated data.

An Overview of Fractional Processes and Fractional-Order ...

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