Gas Turbines Modeling, Simulation, and Control: Using Artificial Neural Networks

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Gas Turbines Modeling, Simulation, and Control: Using Artificial Neural Networks provides new approaches and novel solutions to the modeling, simulation, and control of gas turbines (GTs) using artificial neural networks (ANNs). After delivering a brief introduction to GT performance and classification, the book:

- Outlines important criteria to consider at the beginning of the GT modeling process, such as GT types and configurations, control system types and configurations, and modeling methods and objectives
- Highlights research in the fields of white-box and black-box modeling, simulation, and control of GTs, exploring models of low-power GTs, industrial power plant gas turbines (IPGTs), and aero GTs
- Discusses the structure of ANNs and the ANN-based model-building process, including system analysis, data acquisition and preparation, network architecture, and network training and validation
- Presents a noteworthy ANN-based methodology for offline system identification of GTs, complete with validated models using both simulated and real operational data
- Covers the modeling of GT transient behavior and start-up operation, and the design of proportional-integral-derivative (PID) and neural network-based controllers

Gas Turbines Modeling, Simulation, and Control: Using Artificial Neural Networks not only offers a comprehensive review of the state of the art of gas turbine modeling and intelligent techniques, but also demonstrates how artificial intelligence can be used to solve complicated industrial problems, specifically in the area of GTs.

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