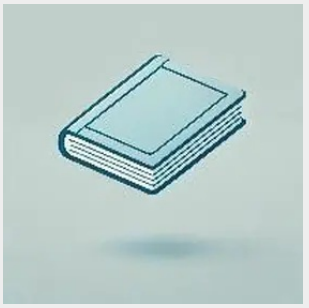
Bhadola / Chaudhary

Pattern Recognition Techniques in Gas Sensing



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Pattern Recognition Techniques in Gas Sensing overviews the methods and technologies used to detect and analyze gases through advanced pattern recognition approaches. The book begins by introducing the fundamentals of gas sensors and their unique data characteristics, laying the groundwork for understanding the complexities involved in gas detection. It then explores the basics of pattern recognition, detailing various statistical methods that have been traditionally employed to interpret sensor data. The text looks into Bayesian and probabilistic methods, offering insights into their applications for improving gas sensing accuracy. Cluster analysis techniques are examined as tools for grouping sensor responses to identify specific gas patterns. The integration of machine learning in gas sensing is thoroughly discussed, highlighting how these algorithms enhance detection capabilities by learning from complex datasets. Further, the book presents deep learning techniques, showcasing their power in handling large volumes of sensor data and extracting meaningful features for precise gas identification. Data processing techniques essential for preparing and refining sensor outputs are also covered, providing readers with practical knowledge for real-world applications and future directions.

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