

Sommaire :

1. Introduction to Neuro-Fuzzy Systems

- * Fundamental concepts of fuzzy systems**
- * Introduction to neural networks**
- * Motivation for neuro-fuzzy controllers**

2. Theory of Fuzzy Controllers

- * Fuzzy logic and fuzzy rules**
- * Methods of fuzzy inference**
- * Defuzzification and key parameters**

3. Fundamentals of Neural Networks

- * Structure and functioning of neural networks**
- * Supervised and unsupervised learning**
- * Backpropagation and optimization algorithms**

4. Neuro-Fuzzy Integration

- * Architecture of neuro-fuzzy controllers**
- * Design and learning methods**
- * Rule adaptation and self-optimization**

5. Practical Applications

- * Motor control and mechanical systems**
- * Industrial process management**
- * Robotics and autonomous systems**
- * Applications in signal processing and energy**

6. Performance and Comparison

- * Evaluation criteria for controllers**
- * Comparison with classical controllers**
- * Advantages and limitations of neuro-fuzzy approaches**

7. Challenges and Future Perspectives

- * Implementation issues and complexity**
- * Recent advances and research trends**

*** Potential of hybrid systems for AI and automation**