Control of Complex Systems

Real-World Complex Systems

High-Tech Applications

- Aerospace Applications
- Telecommunications
- Data Communications
- Robotics and Vision Systems
- Micro and Nano-electronics
- Process Control

Control theory is the enabling technology for most high-tech applications

Application Domains

- Entertainment
- Instrumentation
- Mechatronics
- Material Science
- Biology
- Finance

Control Engineering

Engineering Design

- Modelling
- Identification
- Synthesis
- Analysis
- Prototype
- Implementation

Feedback Control

- Real-world uncertainty

Branches of Control

- Linear vs Nonlinear
- Continuous vs Discrete
- Lumped vs Distributed
- Deterministic vs Stochastic
- Centralised vs Decentralised
- Robust
- Adaptive
- Optimal
- Hybrid
- Hierarchical

The Black Box Concept

Input → Output

Abstraction

Unified theory

Multi-Agent Systems

Autonomous Vehicle Formations

Sensor Networks

Diagnosis and Control

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