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PART I — BASIC APPROACHES

1. Sensitivity Analysis and Lyapunov Stability — I. Gumowski

- Parametric imbedding
- Lyapunov stability
- Direct and indirect relationships between sensitivity and stability
- Analog-computer errors and sensitivity

2. Sensitivity Analysis and Invariant Imbedding

- Invariant imbedding
- Multipoint boundary-value problems
- Boundary-value problems

3. Stability and Sensitivity of Nonlinear Sampled-Data Systems

- Nonlinear sampled-data equations
- Stability concepts
- Equilibrium stability
- Sensitivity of sampled-data systems

4. Sensitivity of Linear Time-Varying Multivariable Systems

- Linear time-varying systems
- Multivariable feedback structures
- Sensitivity operators

5. Optimality, Insensitivity, and Game Theory

- Optimality and insensitivity
- Game-theoretical formulation of sensitivity problems
- Control-system applications of game theory

6. Sensitivity in Engineering Problems

- General engineering applications
- Practical interpretation of sensitivity

PART II — SENSITIVITY FUNCTIONS

This section develops quantitative measures of sensitivity and their application to control-system design.

7. Sensitivity and Dynamic Accuracy of Control Systems

8. On the Determination of Sensitivity Functions with Respect to the Change of System Order

9. Sensitivity Dipole and the Sensitivity Points Method

10. Structural Rules for the Determination of Sensitivity Functions of Nonlinear Nonstationary Systems

The documented contents specifically confirm these papers and their page sequence.

PART III — COMPENSATION OF PARAMETER VARIATIONS

This part deals with methods for reducing the influence of changes in plant parameters and improving system accuracy and reliability.

Main subjects include:

- Compensation of parameter variations
- Sensitivity reduction
- Reliability
- Self-adjustment
- Variable-parameter systems
- Insensitivity techniques
- Design of compensating structures

PART IV — SYNTHESIS OF INSENSITIVE STRUCTURES

This part addresses the **synthesis of control systems whose dynamic characteristics remain relatively insensitive to plant-parameter variations.**

Main subjects include:

- Synthesis of insensitive systems
- Structures invariant to parameter changes
- Variable-structure control systems
- Performance criteria
- Settling time
- Stability under parameter variations
- Self-adjusting systems
- Structural conditions for insensitivity

One documented paper, “**On a Class of Control Systems Invariant to Parameter Changes,**” examines systems designed to preserve stability and transient performance despite parameter variations.

Another, “**Sensitivity of Automatic Control Systems with Variable Structure,**” studies variable-structure systems whose motion can become independent of plant parameters within a particular subspace.

PART V — SENSITIVITY AND OPTIMALITY

The final section examines the relationship between **insensitivity and optimal control**.

Main subjects:

- Sensitivity versus optimality
- Optimal control systems
- Performance optimization
- Insensitive optimal systems
- Game-theoretic formulations
- Synthesis procedures combining performance and insensitivity

The objective is to consider systems that are simultaneously **high-performing and relatively insensitive to parameter uncertainty**.

References and index

The published volume contains **xiii + 442 pages** according to the contemporary bibliographic review.