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4.5.3 Observability Analysis for Branch Variable Formulation; 4.6 Network Topology Processing; 4.7 Network Configuration; 4.7.1 Topological Observability; 4.7.2 Topological Observability Algorithm; 4.8 Topology Error Processing; 4.9 Detection and Identification of Topology Errors; 4.9.1 Residual Analysis; References; 5 Bad Data Detection; 5.1 Bad Data Detection in WLS Method; 5.1.1 Leverage Points. 5.2 Methods of Bad Data Detection 5.2.1 Chi-Squares Test; 5.3 Identification of Bad Data; 5.3.1 Method of Normalized Residual; 5.3.2 Normalized Residuals; 5.3.3 Largest Normalized Residual Test; 5.4 Hypothesis Testing Identification; 5.5 Case Study: Improved Bad Data Processing with Strategic Placement of PMUs; References; Appendix 5A: Chi-Square Test; 6 Robust State Estimation; 6.1 Basic Formulation; 6.2 Breakdown Points; 6.2.1 Leverage Points; 6.3 M-Estimators; 6.4 State Estimation Methods with Bad Data Rejection Properties; 6.4.1 Methods Using Nonquadratic Objective Functions. 6.5 Least Absolute Value State Estimator 6.6 Simplex Method; 6.7 Interior Point Algorithm; 6.8 LMS Estimator; References; Appendix 6A: Linear Programming; 6A.1 Simplex Algorithm; 7 State Estimation Using Line Current Measurements; 7.1 Introduction; 7.2 Modeling State Equations; 7.3 State Estimation with Current Measurements; 7.3.1 Multiple Solutions; 7.4 Methods to Obtain a Unique Solution; 7.5 Determining the Uniqueness of a Solution Based on Numerical Methods; 7.6 Bad Data Detection in the Presence of Current Measurements; 7.6.1 WLS State Estimation; 7.6.2 WLAV Estimation.

Sommario/riassunto

State estimation is one of the most important functions in power system operation and control. This area is concerned with the overall monitoring, control, and contingency evaluation of power systems. It is mainly aimed at providing a reliable estimate of system voltages. State estimator information flows to control centers, where critical decisions are made concerning power system design and operations. This valuable resource provides thorough coverage of this area, helping professionals overcome challenges involving system quality, reliability, security, stability, and economy. Engineers are.

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Different Characteristic Impedances; 2.10 Nonlinear Terminations; 2.11 Discharging a Charged Open Transmission Line; 2.12 Ground/Power Planes; 2.13 The Ground and Power Planes as a Tapered Transmission Line; 2.14 Pulling Energy from a Tapered Transmission Line (TTL) 2.15 The Energy Flow Through Cascaded (Series) Transmission Lines 2.16 An Analysis of Cascaded Transmission Lines; 2.17 Series (Source) Terminating a Transmission Line; 2.18 Parallel (Shunt) Terminations; 2.19 Stubs; 2.20 Decoupling Capacitor as a Stub; 2.21 Transmission Line Networks; 2.22 The Network Program; 2.23 Measuring Characteristic Impedance; Glossary; 3 RADIATION AND INTERFERENCE COUPLING; 3.1 Introduction; 3.2 The Nature of Fields in Logic Structures; 3.3 Classical Radiation; 3.4 Radiation from Step Function Waves; 3.5 Common Mode and Normal Mode 3.6 The Radiation Pattern along a Transmission Line 3.7 Notes on Radiation; 3.8 The Cross Coupling Process (Cross Talk); 3.9 Magnetic Component of Cross Coupling; 3.10 Capacitive Component of Cross Coupling; 3.11 Cross Coupling Continued; 3.12 Cross Coupling between Parallel Transmission Lines of Equal Length; 3.13 Radiation from Board Edges; 3.14 Ground Bounce; 3.15 Susceptibility; Glossary; 4 ENERGY MANAGEMENT; 4.1 Introduction; 4.2 The Power Time Constant; 4.3 Capacitors; 4.4 The Four-Terminal Capacitor or DTL; 4.5 Types of DTLs; 4.6 Circuit Board Resonances; 4.7 Decoupling Capacitors 4.8 The Board Decoupling Problem 4.9 The IC Decoupling Problem; 4.10 Comments on Energy Management; 4.11 Skin Effect; 4.12 Dielectric Losses; 4.13 Split Ground/Power Planes; 4.14 The Analog/digital Interface Problem; 4.15 Power Dissipation; 4.16 Traces through Conducting Planes; 4.17 Trace Geometries that Reduce Termination Resistor Counts; 4.18 The Control of Connecting Spaces; 4.19 Another way to look at Energy Flow in Transmission Lines; Glossary; 5 SIGNAL INTEGRITY ENGINEERING; 5.1 Introduction; 5.2 The Envelope of Permitted Logic Levels; 5.3 Net Lists; 5.4 Noise Budgets 5.5 Logic Level Variation

Sommario/riassunto

A unique, practical approach to the design of high-speed digital circuit boards. The demand for ever-faster digital circuit designs is beginning to render the circuit theory used by engineers ineffective. Digital Circuit Boards presents an alternative to the circuit theory approach, emphasizing energy flow rather than just signal interconnection to explain logic circuit behavior. The book shows how treating design in terms of transmission lines will ensure that the logic will function, addressing both storage and movement of electrical energy on these lines.
