<<自动控制原理与设计>>

图书基本信息

书名：<<自动控制原理与设计>>

13位ISBN编号：9787121191022

10位ISBN编号：7121191024

出版时间：2013-1

出版时间：电子工业出版社

内容概要

《国外计算机科学教材系列:自动控制原理与设计(第6版)(英文版)》是自动控制领域的经典著作，以自动控制系统的分析和设计为主线，在回顾自动控制系统动态响应和反馈控制的基本特性基础上，重点介绍了自动控制系统的三种主流设计方法，即根轨迹设计法、频率响应设计法和状态空间设计法。

书籍目录

Design:Principles and Case Studies A Perspective on Design Principles Chapter Overview 8.1 An Outline of Control Systems Design 8.2 Design of a Satellite's Attitude Control 8.3 Lateral and Longitudinal Control of a Boeing 8.3.1 Yaw Damper 8.3.2 Altitude-Hold Autopilot 8.4 Control of the Fuel-Air Ratio in an Automotive Engine 8.5 Control of the Read/Write Head Assembly of a Hard Disk 8.6 Control of RTP Systems in Semiconductor Wafer Manufacturing 8.7 Chemotaxis or How E. Coli Swims Away from Trouble 8.8 Historical Perspective Problems Appendix Solutions to the Review Questions

章节摘录

版权页： 插图： Regulation is central to the process industries, from making beer to making gaso line. In these industries there are a host of variables that need to be kept constant.Typical examples are temperature, pressure, volume, flow rates, composition, and chemical properties such as pH level. However, before one can regulate by feedback,one must be able to measure the variable ofinterest and before there was control there were sensors. In 1851, George Taylor and David Kendall founded the company that later became the Taylor Instrument Company in Rochester, NY, to make thermometers and barometers for weather forecasting. In 1855 they were making thermometers for several industries, including the brewing industry where they were used for manual control. Other early entries into the instrument field were the Bristol Company founded in Naugatuck, CT, in 1889 by William Bristol, and the Foxboro Comppany founded in Foxboro, MA, in 1908 by William's father and two of his brothers. For example, one of Bristol's instruments was used by Henry Ford to measure (and presumably control) steam pressure while he worked at the Detroit Edison Company.The Bristol Company pioneered in telemetry that permitted instruments to be placed at a distance from the process so a plant manager could monitor several variables at once. As the instruments became more sophisticated, and devices such as motordriven valves became available, they were used in feedback control often using simple on-offmethods as described in Chapter l for the home furnace. An important fact was that the several instrument companies agreed upon standards for the variables usedso a plant could mix and match instruments and controllers from different suppliers.In 1920 Foxboro introduced a controller based on compressed air that included reset or integral action. Eventually, each of these companies introduced instruments and controllers that could implement full PID action. A major step was taken for tuning PID controllers in 1942 when Ziegler and Nichols, working for Taylor Instruments,published their method for tuning based on experimental data. The poster child for the tracking problem was that of the anti-aircraft gun, whether on land or at sea. The idea was to use radar to track the target and to have a controller that would predict the path of the aircraft and aim the gun to a position such that the projectile would hit the target when it got there. The Radiation Laboratory was set up at MIT during World War II to develop such radars, one of which was the SCR-584.Interestingly, one of the major contributors to the control methods developed for this project was none other than Nick Nichols who had earlier worked on tuning PID controllers. When the record of the Rad Lab was written, Nichols was selected to be one of the editors of volume 25 on control.

编辑推荐

《国外计算机科学教材系列:自动控制原理与设计(第6版)(英文版)》阐述了非线性系统的分析与设计，给出了一系列经典控制系统设计实例。
全书在阐述自动控制原理和设计方法的过程中，适时地穿插有MATLAB仿真源代码和仿真实验结果。
《国外计算机科学教材系列:自动控制原理与设计(第6版)(英文版)》由电子工业出版社出版。

<<自动控制原理与设计>>