APPLIED OPTIMAL ESTIMATION

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AN IDEAL SELF STUDY GUIDE FOR PRACTICING ENGINEERS AS WELL AS SENIOR UNDERGRADUATE AND BEGINNING GRADUATE STUDENTS THIS BOOK HIGHLIGHTS THE IMPORTANCE OF BOTH PHYSICAL AND NUMERICAL MODELING IN SOLVING DYNAMICS BASED ESTIMATION PROBLEMS FOUND IN ENGINEERING SYSTEMS

SUCH AS SPACECRAFT ATTITUDE DETERMINATION GPS NAVIGATION ORBIT DETERMINATION AND AIRCRAFT TRACKING WITH MORE THAN 100 PAGES OF NEW MATERIAL THIS REORGANIZED AND EXPANDED EDITION INCORPORATES NEW THEORETICAL RESULTS A NEW CHAPTER ON ADVANCED SEQUENTIAL STATE ESTIMATION AND ADDITIONAL EXAMPLES AND EXERCISES MATLAB CODES ARE AVAILABLE ON THE BOOK S WEBSITE

THIS BEST SELLING TEXT FOCUSES ON THE ANALYSIS AND DESIGN OF COMPLICATED DYNAMICS SYSTEMS
CHOICE CALLED IT A HIGH LEVEL CONCISE BOOK THAT COULD WELL BE USED AS A REFERENCE BY
ENGINEERS APPLIED MATHEMATICIANS AND UNDERGRADUATES THE FORMAT IS GOOD THE PRESENTATION CLEAR
THE DIAGRAMS INSTRUCTIVE THE EXAMPLES AND PROBLEMS HELPFUL REFERENCES AND A MULTIPLE CHOICE
EXAMINATION ARE INCLUDED

MOST NEWCOMERS TO THE FIELD OF LINEAR STOCHASTIC ESTIMATION GO THROUGH A DIFFICULT PROCESS IN UNDERSTANDING AND APPLYING THE THEORY THIS BOOK MINIMIZES THE PROCESS WHILE INTRODUCING THE FUNDAMENTALS OF OPTIMAL ESTIMATION OPTIMAL ESTIMATION OF DYNAMIC SYSTEMS EXPLORES TOPICS THAT ARE IMPORTANT IN THE FIELD OF CONTROL WHERE THE SIGNALS RECEIVED ARE USED TO DETERMINE HIGHLY SENSITIVE PROCESSES SUCH AS THE FLIGHT PATH OF A PLANE THE ORBIT OF A SPACE VEHICLE OR THE CONTROL OF A MACHINE THE AUTHORS USE DYNAMIC MODELS FROM MECHANICAL AND AEROSPACE ENGINEERING TO PROVIDE IMMEDIATE RESULTS OF ESTIMATION CONCEPTS WITH A MINIMAL RELIANCE ON MATHEMATICAL SKILLS THE BOOK DOCUMENTS THE DEVELOPMENT OF THE CENTRAL CONCEPTS AND METHODS OF OPTIMAL ESTIMATION THEORY IN A MANNER ACCESSIBLE TO ENGINEERING STUDENTS APPLIED MATHEMATICIANS AND PRACTICING ENGINEERS IT INCLUDES RIGOROUS THEORETIAL DERIVATIONS AND A SIGNIFICANT AMOUNT OF QUALITIATIVE DISCUSSION AND JUDGEMENTS IT ALSO PRESENTS PROTOTYPE ALGORITHMS GIVING DETAIL AND DISCUSSION TO STIMULATE DEVELOPMENT OF EFFICIENT COMPUTER PROGRAMS AND INTELLIGENT USE OF THEM THIS BOOK ILLUSTRATES THE APPLICATION OF OPTIMAL ESTIMATION METHODS TO PROBLEMS WITH VARYING DEGREES OF ANALYTICAL AND NUMERCIAL DIFFICULTY IT COMPARES VARIOUS APPROACHES TO HELP DEVELOP A FEEL FOR THE ABSOLUTE AND RELATIVE UTILITY OF DIFFERENT METHODS AND PROVIDES MANY APPLICATIONS IN THE FIELDS OF AEROSPACE MECHANICAL AND ELECTRICAL ENGINEERING

OPTIMAL ESTIMATION OF DYNAMIC SYSTEMS SECOND EDITION HIGHLIGHTS THE IMPORTANCE OF BOTH

PHYSICAL AND NUMERICAL MODELING IN SOLVING DYNAMICS BASED ESTIMATION PROBLEMS FOUND IN ENGINEERING SYSTEMS ACCESSIBLE TO ENGINEERING STUDENTS APPLIED MATHEMATICIANS AND PRACTICING ENGINEERS THE TEXT PRESENTS THE CENTRAL CONCEPTS AND METHODS OF OPTIMAL ESTIMATION THEORY AND APPLIES THE METHODS TO PROBLEMS WITH VARYING DEGREES OF ANALYTICAL AND NUMERICAL DIFFICULTY DIFFERENT APPROACHES ARE OFTEN COMPARED TO SHOW THEIR ABSOLUTE AND RELATIVE UTILITY THE AUTHORS ALSO OFFER PROTOTYPE ALGORITHMS TO STIMULATE THE DEVELOPMENT AND PROPER USE OF EFFICIENT COMPUTER PROGRAMS MATLAB CODES FOR THE EXAMPLES ARE AVAILABLE ON THE BOOK S WEBSITE NEW TO THE SECOND EDITION WITH MORE THAN 100 PAGES OF NEW MATERIAL THIS REORGANIZED EDITION EXPANDS UPON THE BEST SELLING ORIGINAL TO INCLUDE COMPREHENSIVE DEVELOPMENTS AND UPDATES IT INCORPORATES NEW THEORETICAL RESULTS AN ENTIRELY NEW CHAPTER ON ADVANCED SEQUENTIAL STATE ESTIMATION AND ADDITIONAL EXAMPLES AND EXERCISES AN IDEAL SELF STUDY GUIDE FOR PRACTICING ENGINEERS AS WELL AS SENIOR UNDERGRADUATE AND BEGINNING GRADUATE STUDENTS THE BOOK INTRODUCES THE FUNDAMENTALS OF ESTIMATION AND HELPS NEWCOMERS TO UNDERSTAND THE RELATIONSHIPS BETWEEN THE ESTIMATION AND MODELING OF DYNAMICAL SYSTEMS IT ALSO ILLUSTRATES THE APPLICATION OF THE THEORY TO REAL WORLD SITUATIONS SUCH AS SPACECRAFT ATTITUDE DETERMINATION GPS NAVIGATION ORBIT DETERMINATION AND AIRCRAFT TRACKING

THE TOPICS OF CONTROL ENGINEERING AND SIGNAL PROCESSING CONTINUE TO FLOURISH AND DEVELOP IN COMMON WITH GENERAL SCIENTIFIC INVESTIGATION NEW IDEAS CONCEPTS AND INTERPRETATIONS EMERGE QUITE SPONTANEOUSLY AND THESE ARE THEN DISCUSSED USED DISCARDED OR SUBSUMED INTO THE PREVAILING SUBJECT PARADIGM SOMETIMES THESE INNOVATIVE CONCEPTS COALESCE INTO A NEW SUB DISCIPLINE WITHIN THE BROAD SUBJECT TAPESTRY OFCONTROL AND SIGNAL PROCESSING THIS PRELIMINARY BATDE BETWEEN OLD AND NEW USUALLY TAKES PLACE AT CONFERENCES THROUGH THE INTERNET AND IN THE JOURNALS OF THE DISCIPLINE AFTER A LITDE MORE MATURITY HAS BEEN ACQUIREDHAS BEEN ACQUIRED BY THE NEW CONCEPTS THEN ARCHIVAL PUBLICATION AS ASCIENTIFICORENGINEERING MONOGRAPH MAYOCCUR ANEWCONCEPTIN CONTROL AND SIGNAL PROCESSING IS KNOWN TO HAVE ARRIVED WHEN SUFFICIENT MATERIAL HAS DEVELOPED FOR THE TOPIC TO BE TAUGHT AS A SPECIALISED TUTORIAL WORKSHOP OR AS A COURSE TO UNDERGRADUATES GRADUATES OR INDUSTRIAL ENGINEERS THE ADVANCED TEXTBOOKS IN CONTROL AND SIGNAL PROCESSING SERIES IS DESIGNED AS A VEHICLE FOR THE SYSTEMATIC PRESENTATION

OFCOURSE MATERIAL FOR BOTH POPULAR AND INNOVATIVE TOPICS IN THE DISCIPLINE IT IS HOPED THAT PROSPECTIVE AUTHORS WILL WELCOME THE OPPORTUNITY TO PUBLISH A STRUCTURED PRESENTATION OF EITHER EXISTING SUBJECT AREAS OR SOME OF THE NEWER EMERGING CONTROL AND SIGNAL PROCESSING TECHNOLOGIES

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