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MOBILE AD HOC NETWORKS ENERGY EFFICIENT SMART PHONES FOR 5G NETWORKS ENERGY-EFFICIENT SPECTRUM MANAGEMENT FOR COGNITIVE RADIO SENSOR NETWORKS ENERGY EFFICIENCY IN WIRELESS NETWORKS ENERGY EFFICIENT COOPERATIVE WIRELESS COMMUNICATION AND NETWORKS LTE SELF-ORGANISING NETWORKS (SON) ENERGY-EFFICIENT ALGORITHMS AND PROTOCOLS FOR WIRELESS BODY SENSOR NETWORKS MATHEMATICAL OPTIMIZATION FOR EFFICIENT AND ROBUST ENERGY NETWORKS SERVICE EFFICIENT NETWORK INTERCONNECTION VIA SATELLITE MANAGEMENT OF WATER NETWORKS. PROCEEDINGS OF THE CONFERENCE «EFFICIENT MANAGEMENT OF WATER NETWORKS. DESIGN AND REHABILITATION TECHNIQUES». FERRARA, MAY 2006 COMMUNICATION EFFICIENT FEDERATED LEARNING FOR WIRELESS NETWORKS ENERGY-EFFICIENT SCHEDULING UNDER DELAY CONSTRAINTS FOR WIRELESS NETWORKS EFFICIENT INTEGRATION OF 5G AND BEYOND HETEROGENEOUS NETWORKS ENERGY-EFFICIENT TECHNOLOGIES FOR THE DISMOUNTED SOLDIER LEARNING IN ENERGY-EFFICIENT NEUROMORPHIC COMPUTING: ALGORITHM AND ARCHITECTURE CO-DESIGN WIRELESS SENSOR NETWORKS AND ENERGY EFFICIENCY: PROTOCOLS, ROUTING AND MANAGEMENT FIRST INTERNATIONAL CONFERENCE ON RESOURCE EFFICIENCY IN INTERORGANIZATIONAL NETWORKS - RESEFF 2013 - SPECTRUM SHARING IN WIRELESS NETWORKS COST-EFFICIENT NETWORK MANAGEMENT MAKING YOUR DATA CENTER ENERGY EFFICIENT ENERGY EFFICIENCY IN COMMUNICATIONS AND NETWORKS LARGE-SCALE DISTRIBUTED SYSTEMS AND ENERGY EFFICIENCY EFFICIENT PROCESSING OF DEEP NEURAL NETWORKS ENERGY-EFFICIENT HIGH PERFORMANCE COMPUTING EFFICIENCY OF WIRELESS NETWORKS WIRELESS SENSOR NETWORKS PROTOCOLS FOR HIGH-EFFICIENCY WIRELESS NETWORKS FUTURE INTENT-BASED NETWORKING MOBILE, WIRELESS AND SENSOR NETWORKS MODELING AND SIMULATION OF COMPUTER NETWORKS AND SYSTEMS SUBNET DESIGN FOR EFFICIENT NETWORKS THE FUTURE INTERNET ENERGY EFFICIENCY FCC RECORD COGNITIVE RADIO, MOBILE COMMUNICATIONS AND WIRELESS NETWORKS FOOD CHAINS: QUALITY, SAFETY AND EFFICIENCY IN A CHALLENGING WORLD MODELING THE POWER CONSUMPTION AND ENERGY EFFICIENCY OF TELECOMMUNICATIONS NETWORKS AN INTRODUCTION TO ENERGY EFFICIENT DATA CENTERS FOR PROFESSIONAL ENGINEERS ENERGY EFFICIENCY IN AIR TRANSPORTATION ENERGY EFFICIENCY IMPROVEMENT OF GEOTECHNICAL SYSTEMS

MOBILE Ad Hoc Networks 2006-07-01

THIS BOOK PRESENTS THE TIME RESERVATION USING ADAPTIVE CONTROL FOR ENERGY EFFICIENT TRACE FAMILY OF PROTOCOL ARCHITECTURES THAT PROVIDE SUCH DYNAMIC COORDINATED CHANNEL ACCESS IN A DISTRIBUTED MANNER ENABLING ENERGY EFFICIENT REAL TIME DATA COMMUNICATIONS IN MANETS FURTHERMORE THIS BOOK PROVIDES AN INTRODUCTION TO THE FUNDAMENTALS OF MANETS AN OVERVIEW OF PROTOCOLS FOR EACH LAYER OF THE PROTOCOL STACK AND A DISCUSSION OF THE ISSUES INVOLVED WITH ENERGY EFFICIENT PROTOCOL DESIGN AND QUALITY OF SERVICE FOR REAL TIME DATA TRANSMISSION

ENERGY EFFICIENT SMART PHONES FOR 5G NETWORKS 2014-10-09

THIS BOOK ADDRESSES CURRENT TECHNOLOGY TRENDS AND REQUIREMENTS LEADING TOWARDS THE NEXT ERA IN MOBILE COMMUNICATION HANDSETS AND BEYOND THAT THE BOOK PROPOSES INNOVATIVE SOLUTIONS THAT COULD BE CANDIDATE SOLUTIONS FOR 5G PHONES IT ADOPTS A MULTIDISCIPLINARY AND INTERDISCIPLINARY STANCE TOWARDS HANDSET DESIGN A NECESSARY INGREDIENT IF 5TH GENERATION HANDSET AND SERVICES ARE TO REALLY TAKE OFF THEREFORE THE SCOPE OF THE BOOK TARGETS A BROAD RANGE OF SUBJECTS INCLUDING ENERGY EFFICIENCY RF DESIGN COOPERATION CONTEXT AWARE SYSTEMS ROAMING AND SHORT RANGE NETWORKING ALL OF WHICH WORKING IN SYNERGY TO PROVIDE SEAMLESS MOBILITY AND HIGH SPEED CONNECTIVITY WITHIN A HETNET ENVIRONMENT SPECIFICALLY THE AUTHORS INVESTIGATE HOW WE CAN EXPLOIT THE COOPERATION PARADIGM AND CONTEXT AWARE MECHANISM WORKING IN SYNERGY TO PROVIDE ENERGY COMPLIANT PHONES THAT CAN INTRODUCE POWER SAVINGS OF UP TO 50 ON STATE OF THE ART GOING BEYOND THIS A CHAPTER ON BUSINESS MODELING APPROACHES IS ALSO INCLUDED BASED ON INCENTIVE MECHANISMS FOR COOPERATION THAT WILL PROVIDE THE NECESSARY LEVERAGE TO PROMOTE THE UP TAKE OF THE PROPOSED TECHNOLOGY

ENERGY-EFFICIENT SPECTRUM MANAGEMENT FOR COGNITIVE RADIO SENSOR NETWORKS 2017-08-01

THIS MONOGRAPH ADDRESSES THE SPECTRUM SCARCITY PROBLEM BY PROVIDING A COMPREHENSIVE OVERVIEW OF SPECTRUM RESOURCE MANAGEMENT IN COGNITIVE RADIO SENSOR NETWORKS CRSNS IT SHOWS A VARIETY OF CRSN APPLICATIONS COVERING MACHINE TO MACHINE COMMUNICATIONS CYBER PHYSICAL SYSTEMS AND INTERNET OF THINGS THE AUTHORS EXPLORE THE BENEFITS OF AN INTEGRATED ENERGY EFFICIENT SPECTRUM MANAGEMENT SOLUTION FOR CRSNS INCLUDING SPECTRUM SENSING DECISION AND ALLOCATION BOTH THEORETICAL AND EXPERIMENTAL ASPECTS OF CRSNS ARE COVERED IN DETAIL ACADEMICS RESEARCHERS AND DEVELOPERS WILL FIND THIS MONOGRAPH AN EXCEPTIONAL RESOURCE WITH VALUABLE KNOWLEDGE AND INSIGHTS IT ALSO HAS EXTENSIVE REFERENCES FROM TOP JOURNALS CONFERENCE PROCEEDINGS BOOKS AND STANDARDS

ENERGY EFFICIENCY IN WIRELESS NETWORKS 2013-01-24

THE LAST DECADE HAS WITNESSED AN UNPRECEDENTED DEVELOPMENT AND GROWTH IN GLOBAL WIRELESS COMMUNICATIONS SYSTEMS TECHNOLOGIES AND NETWORK TRAFFIC GENERATED OVER NETWORK INFRASTRUCTURES THIS BOOK PRESENTS STATE OF THE ART ENERGY EFFICIENT TECHNIQUES DESIGNS AND IMPLEMENTATIONS THAT PERTAIN TO WIRELESS COMMUNICATION NETWORKS SUCH AS CELLULAR NETWORKS WIRELESS LOCAL AREA NETWORKS WLANS AND WIRELESS AD HOC NETWORKS WAHNS INCLUDING MOBILE AD HOC NETWORKS MANETS AND WIRELESS SENSOR NETWORKS WSNS AS THEY ARE DEPLOYED ACROSS THE WORLD TO FACILITATE ALWAYS ON RELIABLE HIGH SPEED WIRELESS ACCESS FROM ANYWHERE AT ANYTIME TO ACCOMMODATE THE NEW PARADIGM OF THE INTERNET OF THINGS IOT THE PERVASIVE AND EXPONENTIAL GROWTH OF WI FI AND THE IMPACT OF BANDWIDTH INTENSIVE APPLICATIONS ON THE ENERGY CONSUMPTION OF WI FI ENABLED DEVICES ARE DISCUSSED ALONG WITH ENERGY HARVESTING AS AN ADVANTAGEOUS OPTION TO POWER WAHNS THE BOOK AIMS TO SERVE AS A USEFUL REFERENCE FOR RESEARCHERS STUDENTS REGULATORY AUTHORITIES AND EDUCATORS

ENERGY EFFICIENT COOPERATIVE WIRELESS COMMUNICATION AND NETWORKS 2014-11-11

COMPARED WITH CONVENTIONAL COMMUNICATIONS COOPERATIVE COMMUNICATION ALLOWS MULTIPLE USERS IN A WIRELESS NETWORK TO COORDINATE THEIR PACKET TRANSMISSIONS AND SHARE EACH OTHER S RESOURCES THUS ACHIEVING HIGH PERFORMANCE GAIN AND BETTER SERVICE COVERAGE AND RELIABILITY ENERGY EFFICIENT COOPERATIVE WIRELESS COMMUNICATION AND NETWORKS PROVIDES A COMPREHENSIVE LOOK AT ENERGY EFFICIENCY AND SYSTEM DESIGN OF COOPERATIVE WIRELESS COMMUNICATION INTRODUCING EFFECTIVE COOPERATIVE WIRELESS COMMUNICATION SCHEMES THE BOOK SUPPLIES THE UNDERSTANDING AND METHODS REQUIRED TO IMPROVE ENERGY EFFICIENCY RELIABILITY AND END TO END PROTOCOL DESIGNS FOR WIRELESS COMMUNICATION SYSTEMS IT EXPLAINS THE PRACTICAL BENEFITS AND LIMITATIONS OF COOPERATIVE TRANSMISSIONS ALONG WITH THE ASSOCIATED DESIGNS OF UPPER LAYER PROTOCOLS INCLUDING MAC ROUTING AND TRANSPORT PROTOCOL THE BOOK CONSIDERS POWER EFFICIENCY AS A MAIN OBJECTIVE IN COOPERATIVE COMMUNICATION TO ENSURE QUALITY OF SERVICE QOS REQUIREMENTS IT EXPLAINS HOW TO BRING THE PERFORMANCE GAIN AT THE PHYSICAL LAYER UP TO THE NETWORK LAYER AND HOW TO ALLOCATE NETWORK RESOURCES DYNAMICALLY THROUGH MAC SCHEDULING AND ROUTING TO TRADE OFF THE PERFORMANCE BENEFITS OF GIVEN TRANSMISSIONS AGAINST NETWORK COSTS BECAUSE THE TECHNIQUES DETAILED IN EACH CHAPTER CAN HELP READERS ACHIEVE ENERGY EFFICIENCY AND RELIABILITY IN WIRELESS NETWORKS THEY HAVE THE POTENTIAL TO IMPACT A RANGE OF INDUSTRY AREAS INCLUDING WIRELESS COMMUNICATION WIRELESS SENSOR NETWORKS AND AD HOC NETWORKS THE BOOK INCLUDES NUMEROUS EXAMPLES BEST PRACTICES AND MODELS THAT CAPTURE KEY ISSUES IN REAL WORLD APPLICATIONS ALONG WITH ALGORITHMS AND TIPS FOR EFFECTIVE DESIGN THE BOOK SUPPLIES THE UNDERSTANDING YOU WILL NEED TO ACHIEVE HIGH PERFORMING AND ENERGY EFFICIENT WIRELESS NETWORKS WITH IMPROVED SERVICE COVERAGE AND RELIABILITY

LTE SELF-ORGANISING NETWORKS (SON) 2011-12-28

COVERING THE KEY FUNCTIONAL AREAS OF LTE SELF ORGANISING NETWORKS SON THIS BOOK INTRODUCES THE TOPIC AT AN ADVANCED LEVEL BEFORE EXAMINING THE STATE OF THE ART CONCEPTS THE REQUIRED BACKGROUND ON LTE NETWORK SCENARIOS TECHNOLOGIES AND GENERAL SON CONCEPTS IS FIRST GIVEN TO ALLOW READERS WITH BASIC KNOWLEDGE OF MOBILE NETWORKS TO UNDERSTAND THE DETAILED DISCUSSION OF KEY SON FUNCTIONAL AREAS SELF CONFIGURATION OPTIMISATION HEALING LATER THE BOOK PROVIDES DETAILS AND REFERENCES FOR ADVANCED READERS FAMILIAR WITH LTE AND SON INCLUDING THE LATEST STATUS OF 3GPP STANDARDISATION BASED ON THE DEFINED NEXT GENERATION MOBILE NETWORKS NGMN AND 3GPP SON USE CASES THE BOOK ELABORATES TO GIVE THE FULL PICTURE OF A SON ENABLED SYSTEM INCLUDING ITS ENABLING TECHNOLOGIES ARCHITECTURE AND OPERATION HETEROGENEOUS NETWORKS INCLUDING DIFFERENT CELL HIERARCHY LEVELS AND MULTIPLE RADIO ACCESS TECHNOLOGIES AS A NEW DRIVER FOR SON ARE ALSO DISCUSSED INTRODUCES THE FUNCTIONAL AREAS OF LTE SON SELF OPTIMISATION CONFIGURATION AND HEALING AND ITS STANDARDISATION ALSO GIVING NGMN AND 3GPP USE CASES EXPLAINS THE DRIVERS REQUIREMENTS CHALLENGES ENABLING TECHNOLOGIES AND ARCHITECTURES FOR A SON ENABLED SYSTEM COVERS MULTI TECHNOLOGY 2G 3G ASPECTS AS WELL AS CORE NETWORK AND END TO END OPERATIONAL ASPECTS WRITTEN BY EXPERTS WHO HAVE BEEN CONTRIBUTING TO THE DEVELOPMENT AND STANDARDISATION OF THE LTE SELF ORGANISING NETWORKS CONCEPT SINCE ITS INCEPTION EXAMINES THE IMPACT OF NEW NETWORK ARCHITECTURES HETEROGENEOUS NETWORKS TO NETWORK OPERATION FOR EXAMPLE MULTIPLE CELL LAYERS AND RADIO ACCESS TECHNOLOGIES

ENERGY-EFFICIENT ALGORITHMS AND PROTOCOLS FOR WIRELESS BODY SENSOR NETWORKS 2019-08-28

THIS BOOK PROVIDES A SYSTEMATIC TREATMENT OF THE THEORETICAL FOUNDATION AND ALGORITHMIC TOOLS NECESSARY IN THE DESIGN OF ENERGY EFFICIENT ALGORITHMS AND PROTOCOLS IN WIRELESS BODY SENSOR NETWORKS WBSNS THESE PROBLEMS ADDRESSED IN THE BOOK ARE OF BOTH FUNDAMENTAL AND PRACTICAL IMPORTANCE SPECIFICALLY THE BOOK DELIVERS A COMPREHENSIVE TREATMENT ON THE FOLLOWING PROBLEMS RANGING FROM THEORETICAL MODELING AND ANALYSIS TO PRACTICAL ALGORITHM DESIGN AND OPTIMIZATION ENERGY EFFICIENT CLUSTERING BASED LEADER ELECTION ALGORITHMS IN WBSNS MAC PROTOCOL FOR DUTY CYCLING WBSNS WITH CONCURRENT TRAFFIC MULTI CHANNEL BROADCAST ALGORITHMS IN DUTY CYCLING WBSNS AND ENERGY EFFICIENT SLEEP SCHEDULING ALGORITHMS IN WBSNS TARGET READERS OF THE BOOK ARE RESEARCHERS AND ADVANCED LEVEL ENGINEERING STUDENTS INTERESTED IN ACQUIRING IN DEPTH KNOWLEDGE ON THE TOPIC AND ON WBSNS AND THEIR APPLICATIONS BOTH FROM THEORETICAL AND ENGINEERING PERSPECTIVE

MATHEMATICAL OPTIMIZATION FOR EFFICIENT AND ROBUST ENERGY NETWORKS 2021-03-19

THIS BOOK PRESENTS A COLLECTION OF ENERGY PRODUCTION AND DISTRIBUTION PROBLEMS IDENTIFIED BY THE MEMBERS OF THE COST ACTION TD1207 MATHEMATICAL OPTIMIZATION IN THE DECISION SUPPORT SYSTEMS FOR EFFICIENT AND ROBUST ENERGY NETWORKS THE AIM OF THE COST ACTION WAS TO COORDINATE THE EFFORTS OF THE EXPERTS IN DIFFERENT FIELDS FROM ACADEMIA AND INDUSTRY IN DEVELOPING INNOVATIVE TOOLS FOR QUANTITATIVE DECISION MAKING AND APPLY THEM TO THE EFFICIENT AND ROBUST DESIGN AND MANAGEMENT OF ENERGY NETWORKS THE WORK COVERS THREE MAIN GOALS TO BE A NIMBLE WHILE COMPREHENSIVE RESOURCE OF SEVERAL REAL LIFE BUSINESS PROBLEMS WITH A CATEGORIZED SET OF POINTERS TO MANY RELEVANT PRESCRIPTIVE PROBLEMS FOR ENERGY SYSTEMS TO OFFER A BALANCED MIX OF SCIENTIFIC AND INDUSTRIAL VIEWS TO EVOLVE OVER TIME IN A FLEXIBLE AND DYNAMIC WAY GIVING FROM TIME TO TIME A MORE SCIENTIFIC OR INDUSTRIAL OR EVEN POLITICAL IN A BROAD SENSE WEIGHED PERSPECTIVE IT IS ADDRESSED TO RESEARCHERS AND PROFESSIONALS WORKING IN THE FIELD

SERVICE EFFICIENT NETWORK INTERCONNECTION VIA SATELLITE 2002-01-21

A LOCAL AREA NETWORK LAN IS A NETWORK USUALLY WITHIN A SINGLE OFFICE OR BUILDING THAT LINKS DESKTOP COMPUTERS WITH EACH OTHER AND WITH PERIPHERALS SUCH AS SERVERS AND PRINTERS THE INTERCONNECT IS THE ELECTRICAL AND FUNCTIONAL ASSOCIATION OF TWO DIFFERENT SERVICES OFTEN PROVIDED BY DIFFERENT SUPPLIERS AND IT IS FROM LAN INTER CONNECTION THAT TELECOMS OPERATORS SEEK TO PROFIT THE APPLICATION OF LAN INTERCONNECTION VIA SATELLITE CAN BE USED TO COMPLEMENT AND EXTEND EXISTING TERRESTRIAL PUBLIC ACCESS NETWORKS THROUGH INTERCONNECTION OF CLUSTERS OF BROADBAND ISLANDS SUCH AS LANS AND MANS IN REMOTE REGIONS WHERE TERRESTRIAL LINES ARE EXPENSIVE TO INSTALL AND OPERATE EXAMPLES INCLUDE HOSPITALS CLINICS IN REMOTE AND RURAL AREAS CAN BE CONNECTED TO THE CENTRAL HOSPITALS IN A TELE MEDICINE ENVIRONMENT REMOTE OFFICES CAN BE CONNECTED TO THE CENTRAL OFFICE TO FACILITATE TELE WORKING UNIVERSITY COLLEGES CAN BE INTER CONNECTED TO PROVIDE TELE EDUCATION FACILITIES SIMILARLY THE POSSIBILITY TO PROVIDE ACCESS TO SUCH FACILITIES IN DEVELOPING REGIONS OF THE WORLD IS ALSO VIABLE AND PARTICULARLY ATTRACTIVE IN THE SHORT TO MID TERM PRIVATE LAN CONNECTION FACILITIES COULD ALSO BE MADE AVAILABLE TO THE CORPORATE USER OFFERING THE POSSIBILITY TO ESTABLISH BROADBAND INTERNET ACCESS WITHIN A CLOSED USER GROUP SUCH A SCENARIO COULD BE OF INTEREST TO THE FINANCIAL SECTOR BY GATHERING THE KNOWLEDGE AND EXPERIENCES OF WELL KNOWN SATELLITE SYSTEMS EXPERTS FROM DIFFERENT PARTS OF EUROPE THIS COMPREHENSIVE VOLUME PROVIDES DETAILED ANALYSIS ON TECHNICAL ASPECTS FOR INTERCONNECTING LOCAL AREA NETWORK USING SATELLITE STARTING FROM TRAFFIC SOURCE MODELLING FOR DIFFERENT TYPES OF APPLICATIONS AND SERVICES TO DIFFERENT TYPES OF TRANSMISSION TECHNIQUES AND NETWORKING FUNCTIONS FOR SUPPORTING SUCH SERVICES DIFFERENT CASE STUDIES ARE PRESENTED TO ANALYSE THE PERFORMANCE OF SUCH TECHNOLOGIES BY PROVIDING AN INSIGHT TO CURRENT AND FUTURE DEVELOPMENTS IN SATELLITE COMMUNICATIONS SYSTEMS AND BY COVERING A BROAD RANGE OF MATERIALS IN TECHNICAL ASPECTS IN RELATION TO SATELLITE COMMUNICATION SYSTEMS TECHNOLOGIES THIS VOLUME WILL BE OF TREMENDOUS USE TO RESEARCHERS ACADEMIA AND INDUSTRY FIRST BOOK TO PRESENT SUCH A THOROUGH DESCRIPTION OF THE RELIABILITY FUNCTIONS OF SATELLITE SYSTEMS DISCUSSES IP OVER SATELLITE PROVIDES A UNIQUE ANALYSIS AND DESCRIPTION OF DIFFERENT SIMULATION TOOLS THAT ARE UNDER DEVELOPMENT FOR EVALUATING THE PERFORMANCE OF SATELLITE SYSTEMS INCLUDES A CHAPTER DEVOTED TO TRAFFIC MODELLING FOR SATELLITE SYSTEMS REVIEWS CURRENT RESEARCH AND DEVELOPMENTS IN SECURITY AND DISCUSSES HOW SUCH SECURITY FUNCTIONS CAN BE IMPLEMENTED OVER SATELLITE NETWORKS ADDRESSES DIFFERENT TYPES OF

ROUTING STRATEGIES AND INCLUDES THREE DIFFERENT CASE STUDIES WHICH HAVE BEEN CARRIED OUT TO ANALYSE THE PERFORMANCE OF DIFFERENT ROUTING STRATEGIES

MANAGEMENT OF WATER NETWORKS. PROCEEDINGS OF THE CONFERENCE «EFFICIENT MANAGEMENT OF WATER NETWORKS. DESIGN AND REHABILITATION TECHNIQUES». **FERRARA, MAY 2006 2007**

PACKET DELAY AND ENERGY CONSUMPTION ARE IMPORTANT CONSIDERATIONS IN WIRELESS AND SENSOR NETWORKS AS THESE METRICS DIRECTLY AFFECT THE QUALITY OF SERVICE OF THE APPLICATION AND THE RESOURCE CONSUMPTION OF THE NETWORK ESPECIALLY FOR A RAPIDLY GROWING CLASS OF REAL TIME APPLICATIONS THAT IMPOSE STRICT RESTRICTIONS ON PACKET DELAYS DYNAMIC RATE CONTROL IS A NOVEL TECHNIQUE FOR ADAPTING THE TRANSMISSION RATE OF WIRELESS DEVICES ALMOST IN REAL TIME TO OPPORTUNISTICALLY EXPLOIT TIME VARYING CHANNEL CONDITIONS AS WELL AS CHANGING TRAFFIC PATTERNS SINCE POWER CONSUMPTION IS NOT A LINEAR FUNCTION OF THE RATE AND VARIES SIGNIFICANTLY WITH THE CHANNEL CONDITIONS ADAPTING THE RATE HAS SIGNIFICANT BENEFITS IN MINIMIZING ENERGY CONSUMPTION THESE BENEFITS HAVE PROMPTED SIGNIFICANT RESEARCH IN DEVELOPING ALGORITHMS FOR ACHIEVING OPTIMAL RATE ADAPTATION WHILE SATISFYING QUALITY OF SERVICE REQUIREMENTS IN THIS BOOK WE PROVIDE A COMPREHENSIVE STUDY OF DYNAMIC RATE CONTROL FOR ENERGY MINIMIZATION UNDER PACKET DELAY CONSTRAINTS WE PRESENT SEVERAL FORMULATIONS AND APPROACHES ADOPTED IN THE LITERATURE RANGING FROM DISCRETE TIME FORMULATIONS AND DYNAMIC PROGRAMMING BASED SOLUTIONS TO CONTINUOUS TIME APPROACHES UTILIZING IDEAS FROM NETWORK CALCULUS AND STOCHASTIC OPTIMAL CONTROL THEORY THE GOAL OF THIS BOOK IS TO EXPOSE THE READER TO THE IMPORTANT PROBLEM OF WIRELESS DATA TRANSMISSION WITH DELAY CONSTRAINTS AND TO THE RICH SET OF TOOLS DEVELOPED IN RECENT YEARS TO ADDRESS IT TABLE OF CONTENTS INTRODUCTION TRANSMISSION RATE ADAPTATION UNDER DEADLINE CONSTRAINTS AVERAGE DELAY CONSTRAINTS

COMMUNICATION EFFICIENT FEDERATED LEARNING FOR WIRELESS NETWORKS **2022-05-31**

THIS BOOK DISCUSSES THE SMOOTH INTEGRATION OF OPTICAL AND RF NETWORKS IN 5G AND BEYOND 5G HETEROGENEOUS NETWORKS HETNETS COVERING BOTH PLANNING AND OPERATIONAL ASPECTS THE INTEGRATION OF HIGH FREQUENCY AIR INTERFACES INTO 5G WIRELESS NETWORKS CAN RELIEVE THE CONGESTED RADIO FREQUENCY RF BANDS VISIBLE LIGHT COMMUNICATION VLC IS NOW EMERGING AS A PROMISING CANDIDATE FOR FUTURE GENERATIONS OF HETNETS HETEROGENEOUS RF OPTICAL NETWORKS COMBINE THE HIGH THROUGHPUT OF VISIBLE LIGHT AND THE HIGH RELIABILITY OF RF HOWEVER WHEN IMPLEMENTING THESE HETNETS IN MOBILE SCENARIOS SEVERAL CHALLENGES ARISE FROM BOTH PLANNING AND OPERATIONAL PERSPECTIVES SINCE THE MMWAVE TERAHERTZ AND VISIBLE LIGHT BANDS SHARE SIMILAR WAVE PROPAGATION CHARACTERISTICS THE CONCEPTS PRESENTED HERE CAN BE BROADLY APPLIED IN ALL SUCH BANDS TO FACILITATE THE PLANNING OF RF OPTICAL HETNETS THE AUTHORS PRESENT AN ALGORITHM THAT SPECIFIES THE JOINT OPTIMAL DENSITIES OF THE BASE STATIONS BY DRAWING ON STOCHASTIC GEOMETRY IN ORDER TO SATISFY THE USERS QUALITY OF SERVICE QOS DEMANDS WITH MINIMUM NETWORK POWER CONSUMPTION FROM AN OPERATIONAL PERSPECTIVE THE BOOK EXPLORES VERTICAL HANDOVERS AND MULTI HOMING USING A COOPERATIVE FRAMEWORK FOR VERTICAL HANDOVERS IT EMPLOYS A DATA DRIVEN APPROACH BASED ON DEEP NEURAL NETWORKS TO PREDICT ABRUPT OPTICAL OUTAGES AND ON THE BASIS OF THIS PREDICTION PROPOSES A REINFORCEMENT LEARNING STRATEGY THAT ENSURES MINIMAL NETWORK LATENCY DURING HANDOVERS IN TERMS OF MULTI HOMING SUPPORT THE AUTHORS EXAMINE THE AGGREGATION OF THE RESOURCES FROM BOTH OPTICAL AND RF NETWORKS ADOPTING A TWO TIMESCALE MULTI AGENT REINFORCEMENT LEARNING STRATEGY FOR OPTIMAL POWER ALLOCATION PRESENTING COMPREHENSIVE PLANNING AND OPERATIONAL STRATEGIES THE BOOK ALLOWS READERS TO GAIN AN IN DEPTH GRASP OF HOW TO INTEGRATE FUTURE COEXISTING NETWORKS AT HIGH FREQUENCY BANDS IN A COOPERATIVE MANNER YIELDING RELIABLE AND HIGH SPEED 5G HETNETS

ENERGY-EFFICIENT SCHEDULING UNDER DELAY CONSTRAINTS FOR WIRELESS NETWORKS **2020-08-26**

THIS BOOK DOCUMENTS ELECTRIC POWER REQUIREMENTS FOR THE DISMOUNTED SOLDIER ON FUTURE ARMY BATTLEFIELDS DESCRIBES ADVANCED ENERGY CONCEPTS AND PROVIDES AN INTEGRATED ASSESSMENT OF TECHNOLOGIES LIKELY TO AFFECT LIMITATIONS AND NEEDS IN THE FUTURE IT SURVEYS TECHNOLOGIES ASSOCIATED WITH BOTH SUPPLY AND DEMAND INCLUDING ENERGY SOURCES AND SYSTEMS LOW POWER ELECTRONICS AND DESIGN COMMUNICATIONS COMPUTERS DISPLAYS AND SENSORS AND NETWORKS PROTOCOLS AND OPERATIONS ADVANCED CONCEPTS DISCUSSED ARE PREDICATED ON CONTINUED DEVELOPMENT BY THE ARMY OF SOLDIER SYSTEMS SIMILAR TO THE LAND WARRIOR SYSTEM ON WHICH THE COMMITTEE BASES ITS PROJECTIONS ON ENERGY USE FINALLY THE VOLUME PROPOSES TWENTY RESEARCH OBJECTIVES TO ACHIEVE ENERGY GOALS IN THE 2025 TIME FRAME

EFFICIENT INTEGRATION OF 5G AND BEYOND HETEROGENEOUS NETWORKS **1997-12-30**

EXPLAINS CURRENT CO DESIGN AND CO OPTIMIZATION METHODOLOGIES FOR BUILDING HARDWARE NEURAL NETWORKS AND ALGORITHMS FOR MACHINE LEARNING APPLICATIONS THIS BOOK FOCUSES ON HOW TO BUILD ENERGY EFFICIENT HARDWARE FOR NEURAL NETWORKS WITH LEARNING CAPABILITIES AND PROVIDES CO DESIGN AND CO OPTIMIZATION METHODOLOGIES FOR BUILDING HARDWARE NEURAL NETWORKS THAT CAN LEARN PRESENTING A COMPLETE PICTURE FROM HIGH LEVEL ALGORITHM TO LOW LEVEL IMPLEMENTATION DETAILS LEARNING IN ENERGY EFFICIENT NEUROMORPHIC COMPUTING ALGORITHM AND ARCHITECTURE CO DESIGN ALSO COVERS MANY FUNDAMENTALS AND ESSENTIALS IN NEURAL NETWORKS E G DEEP LEARNING AS WELL AS HARDWARE IMPLEMENTATION OF NEURAL NETWORKS THE BOOK BEGINS WITH AN OVERVIEW OF NEURAL NETWORKS IT THEN DISCUSSES ALGORITHMS FOR UTILIZING AND TRAINING RATE BASED ARTIFICIAL NEURAL NETWORKS NEXT COMES AN INTRODUCTION TO VARIOUS OPTIONS FOR EXECUTING NEURAL NETWORKS RANGING FROM GENERAL PURPOSE PROCESSORS TO SPECIALIZED HARDWARE FROM DIGITAL ACCELERATOR TO

ANALOG ACCELERATOR A DESIGN EXAMPLE ON BUILDING ENERGY EFFICIENT ACCELERATOR FOR ADAPTIVE DYNAMIC PROGRAMMING WITH NEURAL NETWORKS IS ALSO PRESENTED AN EXAMINATION OF FUNDAMENTAL CONCEPTS AND POPULAR LEARNING ALGORITHMS FOR SPIKING NEURAL NETWORKS FOLLOWS THAT ALONG WITH A LOOK AT THE HARDWARE FOR SPIKING NEURAL NETWORKS THEN COMES A CHAPTER OFFERING READERS THREE DESIGN EXAMPLES TWO OF WHICH ARE BASED ON CONVENTIONAL CMOS AND ONE ON EMERGING NANOTECHNOLOGY TO IMPLEMENT THE LEARNING ALGORITHM FOUND IN THE PREVIOUS CHAPTER THE BOOK CONCLUDES WITH AN OUTLOOK ON THE FUTURE OF NEURAL NETWORK HARDWARE INCLUDES CROSS LAYER SURVEY OF HARDWARE ACCELERATORS FOR NEUROMORPHIC ALGORITHMS CO DESIGN OF ARCHITECTURE AND ALGORITHMS WITH EMERGING DEVICES FOR MUCH IMPROVED COMPUTING EFFICIENCY FOCUSES ON THE CO DESIGN OF ALGORITHMS AND HARDWARE WHICH IS ESPECIALLY CRITICAL FOR USING EMERGING DEVICES SUCH AS TRADITIONAL MEMRISTORS OR DIFFUSIVE MEMRISTORS FOR NEUROMORPHIC COMPUTING LEARNING IN ENERGY EFFICIENT NEUROMORPHIC COMPUTING ALGORITHM AND ARCHITECTURE CO DESIGN IS AN IDEAL RESOURCE FOR RESEARCHERS SCIENTISTS SOFTWARE ENGINEERS AND HARDWARE ENGINEERS DEALING WITH THE EVER INCREASING REQUIREMENT ON POWER CONSUMPTION AND RESPONSE TIME IT IS ALSO EXCELLENT FOR TEACHING AND TRAINING UNDERGRADUATE AND GRADUATE STUDENTS ABOUT THE LATEST GENERATION NEURAL NETWORKS WITH POWERFUL LEARNING CAPABILITIES

ENERGY-EFFICIENT TECHNOLOGIES FOR THE DISMOUNTED SOLDIER 2019-12-31

THIS BOOK FOCUSES ON WIRELESS SENSOR NETWORKS AND THEIR OPERATION COVERING TOPICS INCLUDING ROUTING ENERGY EFFICIENCY AND MANAGEMENT

LEARNING IN ENERGY-EFFICIENT NEUROMORPHIC COMPUTING: ALGORITHM AND ARCHITECTURE CO-DESIGN 2012-01-31

RENEWABLE RAW MATERIALS ARE BECOMING INCREASINGLY IMPORTANT AS AN ALTERNATIVE RESOURCE BASE IN INDUSTRIAL NETWORKS CONSEQUENTLY RESEARCH FOR METHODS IMPROVING THE EFFICIENT USE OF RENEWABLE RESOURCES IN PRODUCTION PROCESSES WITH BY PRODUCTS IS CRUCIAL THE AIM IS CASCADE UTILIZATION THUS THE MULTIPLE UTILIZATION OF A RAW MATERIAL BEFORE ITS CONVERSION INTO ENERGY THE INTERNATIONAL CONFERENCE ON RESOURCE EFFICIENCY IN INTERORGANIZATIONAL NETWORKS RESEFF BRINGS TOGETHER INTERDISCIPLINARY RESEARCHERS DEVELOPING STRATEGIES AND SOLUTION CONCEPTS FOR EFFICIENT RESOURCE UTILIZATION IT IS THEREFORE A PLATFORM FOR SCIENTIFIC EXCHANGE BOTH BETWEEN EXPERTS AS WELL AS INTERDISCIPLINARY GROUPS FROM AGRICULTURAL AND FORESTRY SCIENCE MATHEMATICAL OPTIMIZATION OPERATIONS RESEARCH MARKETING BUSINESS INFORMATICS PRODUCTION AND LOGISTICS THE FOLLOWING FACETS OF THE CHALLENGING TOPIC OF RESOURCE EFFICIENCY IN INTERORGANIZATIONAL NETWORKS ARE COVERED MATERIALS TECHNOLOGIES PLANNING OF PRODUCTION AND VALUE ADDED NETWORKS FOR RENEWABLE RESOURCES AS WELL AS GOVERNANCE COORDINATION AND SALE OF PRODUCTS FROM RENEWABLE RESOURCES

WIRELESS SENSOR NETWORKS AND ENERGY EFFICIENCY: PROTOCOLS, ROUTING AND MANAGEMENT 2013-11-26

SPECTRUM SHARING IN WIRELESS NETWORKS FAIRNESS EFFICIENCY AND SECURITY PROVIDES A BROAD OVERVIEW OF WIRELESS NETWORK SPECTRUM SHARING IN SEVEN DISTINCT SECTIONS THE FIRST SECTION EXAMINES THE BIG PICTURE AND BASIC PRINCIPLES EXPLAINING THE CONCEPTS OF SPECTRUM SHARING HARDWARE SOFTWARE FUNCTION REQUIREMENTS FOR EFFICIENT SHARING AND FUTURE TRENDS OF SHARING STRATEGIES THE SECOND SECTION CONTAINS MORE THAN 10 CHAPTERS THAT DISCUSS DIFFERING APPROACHES TO EFFICIENT SPECTRUM SHARING THE AUTHORS INTRODUCE A NEW COEXISTENCE AND SHARING SCHEME FOR MULTI HOP NETWORKS DESCRIBE THE SPACE TIME SHARING CONCEPT INTRODUCE LTE U AND EXAMINE SHARING IN BROADCAST AND UNICAST ENVIRONMENTS THEY THEN TALK ABOUT DIFFERENT COOPERATION STRATEGIES TO ACHIEVE MUTUAL BENEFITS FOR PRIMARY USERS PU AND SECONDARY USERS SU DISCUSS PROTOCOLS IN A SPECTRUM SHARING CONTEXT AND PROVIDE DIFFERENT GAME THEORY MODELS BETWEEN PUS AND SUS THE THIRD SECTION EXPLAINS HOW TO MODEL THE INTERACTIONS OF PUS AND SUS USING AN EFFICIENT CALCULATION METHOD TO DETERMINE SPECTRUM AVAILABILITY ADDITIONALLY THIS SECTION EXPLAINS HOW TO USE SCHEDULING MODELS TO ACHIEVE EFFICIENT SU TRAFFIC DELIVERY THE SUBJECT OF THE FOURTH SECTION IS MIMO ORIENTED DESIGN IT FOCUSES ON HOW DIRECTIONAL ANTENNAS AND MIMO ANTENNAS GREATLY ENHANCE WIRELESS NETWORK PERFORMANCE THE AUTHORS INCLUDE A FEW CHAPTERS ON CAPACITY RATE CALCULATIONS AS WELL AS BEAMFORMING ISSUES UNDER MIMO ANTENNAS POWER CONTROL IS COVERED IN THE FIFTH SECTION WHICH ALSO DESCRIBES THE INTERFERENCE AWARE POWER ALLOCATION SCHEMES AMONG COGNITIVE RADIO USERS AND THE POWER CONTROL SCHEMES IN COGNITIVE RADIOS THE SIXTH SECTION PROVIDES A COMPREHENSIVE LOOK AT SECURITY ISSUES INCLUDING DIFFERENT TYPES OF SPECTRUM SHARING ATTACKS AND THREATS AS WELL AS CORRESPONDING COUNTERMEASURE SCHEMES THE SEVENTH AND FINAL SECTION COVERS ISSUES PERTAINING TO MILITARY APPLICATIONS AND EXAMINES HOW THE MILITARY TASK PROTECTS ITS DATA FLOWS WHEN SHARING THE SPECTRUM WITH CIVILIAN APPLICATIONS

FIRST INTERNATIONAL CONFERENCE ON RESOURCE EFFICIENCY IN INTERORGANIZATIONAL NETWORKS - ResEff 2013 - 2016-11-17

AN ESSENTIAL RESOURCE THAT ADDRESSES THE ACTUAL ISSUES CONFRONTING THE NETWORK USER AND OR SYSTEM MANAGER WHO MUST DEAL WITH SPECIFIC PROBLEMS WITH CONNECTIONS DISTRIBUTED DATABASES AND THEIR ACCESS THE RELATIVE ADVANTAGES OF EACH TYPE OF PROTOCOL SOFTWARE AND HARDWARE COSTS AND MORE

SPECTRUM SHARING IN WIRELESS NETWORKS 1992

DETAILING POWERFUL METHODS FOR REDUCING THE ENERGY COSTS ASSOCIATED WITH OPERATING A DATA CENTER MAKING YOUR DATA CENTER ENERGY EFFICIENT EXAMINES BOTH EQUIPMENT AND BUILDING FACILITIES IT REVIEWS THE RATIONALE FOR CONSERVING ENERGY AND DEMONSTRATES HOW CONSERVATION AND CAREFUL EQUIPMENT SELECTION CAN LEAD TO SIGNIFICANT IMPROVEMENTS TO YOUR BOTTOM LINE FOR THOSE NOT WELL VERSED IN FINANCIAL OR ENERGY TERMS THE FIRST TWO CHAPTERS PROVIDE A DETAILED

DISCUSSION OF THE TERMS ASSOCIATED WITH DIFFERENT TYPES OF ENERGY AS WELL AS HOW TO COMPUTE THE RETURN ON INVESTMENT FOR ENERGY CONSERVATION EFFORTS THE TEXT INCLUDES TABLES OF MONTHLY EXPENSES ASSOCIATED WITH OPERATING EQUIPMENT THAT WILL HELP YOU CONVERT PROBLEMS INTO SIMPLE TABLE LOOKUP PROCESSES AMONG THE MONEY SAVING TOPICS DISCUSSED IT CONSIDERS HOW TO MINIMIZE THE ENERGY CONSUMPTION OF A WIDE RANGE OF DEVICES A LITTLE UNDERSTOOD TOPIC THAT CAN MAKE A BIG IMPACT ON ENERGY COSTS GENERAL HEATING AND COOLING TECHNIQUES REQUIRED TO EFFECTIVELY MONITOR DIFFERENT TYPES OF METERS PHANTOM ENERGY USAGE AND METHODS FOR MINIMIZING ITS COST TO YOUR ORGANIZATION RECOGNIZING THAT MOST READERS MAY NOT HAVE DIRECT CONTROL OVER THE SELECTION OF A FURNACE OR HOT WATER HEATER THE BOOK PROVIDES YOU WITH THE ABILITY TO RECOGNIZE THE EFFICIENCIES AND INEFFICIENCIES OF VARIOUS TYPES OF DEVICES SO YOU CAN PROVIDE INPUT INTO THE DECISION MAKING PROCESS FROM REPLACING LIGHTING TO CONSOLIDATION AND VIRTUALIZATION IT PROVIDES YOU WITH THE WELL ROUNDED UNDERSTANDING NEEDED TO PROPERLY MANAGE ALL ASPECTS OF THE ENERGY CONSUMED IN YOUR DATA CENTER

COST-EFFICIENT NETWORK MANAGEMENT 2011-09-06

THE TOPIC OF ENERGY EFFICIENCY IN COMMUNICATIONS AND NETWORKS ATTRACTS GROWING ATTENTION DUE TO ECONOMICAL AND ENVIRONMENTAL REASONS THE AMOUNT OF POWER CONSUMED BY INFORMATION AND COMMUNICATION TECHNOLOGIES ICT IS RAPIDLY INCREASING AS WELL AS THE ENERGY BILL OF SERVICE PROVIDERS ACCORDING TO A NUMBER OF STUDIES ICT ALONE IS RESPONSIBLE FOR A PERCENTAGE WHICH VARIES FROM 2 TO 10 OF THE WORLD POWER CONSUMPTION THUS DRIVING RISING COST AND SUSTAINABILITY CONCERNS ABOUT THE ENERGY FOOTPRINT OF THE IT INFRASTRUCTURE ENERGY EFFICIENCY IS AN ASPECT THAT UNTIL RECENTLY WAS ONLY CONSIDERED FOR BATTERY DRIVEN DEVICES TODAY WE SEE ENERGY EFFICIENCY BECOMING A PERVASIVE ISSUE THAT WILL NEED TO BE CONSIDERED IN ALL TECHNOLOGY AREAS FROM DEVICE TECHNOLOGY TO SYSTEMS MANAGEMENT THIS BOOK IS SEEKING TO PROVIDE A COMPILATION OF NOVEL RESEARCH CONTRIBUTIONS ON HARDWARE DESIGN ARCHITECTURES PROTOCOLS AND ALGORITHMS THAT WILL IMPROVE THE ENERGY EFFICIENCY OF COMMUNICATION DEVICES AND NETWORKS AND LEAD TO A MORE ENERGY PROPORTIONAL TECHNOLOGY INFRASTRUCTURE

MAKING YOUR DATA CENTER ENERGY EFFICIENT 2012-04-04

ADDRESSES INNOVATIONS IN TECHNOLOGY RELATING TO THE ENERGY EFFICIENCY OF A WIDE VARIETY OF CONTEMPORARY COMPUTER SYSTEMS AND NETWORKS WITH CONCERNS ABOUT GLOBAL ENERGY CONSUMPTION AT AN ALL TIME HIGH IMPROVING COMPUTER NETWORKS ENERGY EFFICIENCY IS BECOMING AN INCREASINGLY IMPORTANT TOPIC LARGE SCALE DISTRIBUTED SYSTEMS AND ENERGY EFFICIENCY A HOLISTIC VIEW ADDRESSES INNOVATIONS IN TECHNOLOGY RELATING TO THE ENERGY EFFICIENCY OF A WIDE VARIETY OF CONTEMPORARY COMPUTER SYSTEMS AND NETWORKS AFTER AN INTRODUCTORY OVERVIEW OF THE ENERGY DEMANDS OF CURRENT INFORMATION AND COMMUNICATIONS TECHNOLOGY ICT INDIVIDUAL CHAPTERS OFFER IN DEPTH ANALYSES OF SUCH TOPICS AS CLOUD COMPUTING GREEN NETWORKING BOTH WIRED AND WIRELESS MOBILE COMPUTING POWER MODELING THE RISE OF GREEN DATA CENTERS AND HIGH PERFORMANCE COMPUTING RESOURCE ALLOCATION AND ENERGY EFFICIENCY IN PEER TO PEER P2P COMPUTING NETWORKS DISCUSSES MEASUREMENT AND MODELING OF THE ENERGY CONSUMPTION METHOD INCLUDES METHODS FOR ENERGY CONSUMPTION REDUCTION IN DIVERSE COMPUTING ENVIRONMENTS FEATURES A VARIETY OF CASE STUDIES AND EXAMPLES OF ENERGY REDUCTION AND ASSESSMENT TIMELY AND IMPORTANT LARGE SCALE DISTRIBUTED SYSTEMS AND ENERGY EFFICIENCY IS AN INVALUABLE RESOURCE FOR WAYS OF INCREASING THE ENERGY EFFICIENCY OF COMPUTING SYSTEMS AND NETWORKS WHILE SIMULTANEOUSLY REDUCING THE CARBON FOOTPRINT

ENERGY EFFICIENCY IN COMMUNICATIONS AND NETWORKS 2015-03-05

THIS BOOK PROVIDES A STRUCTURED TREATMENT OF THE KEY PRINCIPLES AND TECHNIQUES FOR ENABLING EFFICIENT PROCESSING OF DEEP NEURAL NETWORKS DNNs DNNs ARE CURRENTLY WIDELY USED FOR MANY ARTIFICIAL INTELLIGENCE AI APPLICATIONS INCLUDING COMPUTER VISION SPEECH RECOGNITION AND ROBOTICS WHILE DNNs DELIVER STATE OF THE ART ACCURACY ON MANY AI TASKS IT COMES AT THE COST OF HIGH COMPUTATIONAL COMPLEXITY THEREFORE TECHNIQUES THAT ENABLE EFFICIENT PROCESSING OF DEEP NEURAL NETWORKS TO IMPROVE METRICS SUCH AS ENERGY EFFICIENCY THROUGHPUT AND LATENCY WITHOUT SACRIFICING ACCURACY OR INCREASING HARDWARE COSTS ARE CRITICAL TO ENABLING THE WIDE DEPLOYMENT OF DNNs IN AI SYSTEMS THE BOOK INCLUDES BACKGROUND ON DNN PROCESSING A DESCRIPTION AND TAXONOMY OF HARDWARE ARCHITECTURAL APPROACHES FOR DESIGNING DNN ACCELERATORS KEY METRICS FOR EVALUATING AND COMPARING DIFFERENT DESIGNS FEATURES OF THE DNN PROCESSING THAT ARE AMENABLE TO HARDWARE ALGORITHM CO DESIGN TO IMPROVE ENERGY EFFICIENCY AND THROUGHPUT AND OPPORTUNITIES FOR APPLYING NEW TECHNOLOGIES READERS WILL FIND A STRUCTURED INTRODUCTION TO THE FIELD AS WELL AS A FORMALIZATION AND ORGANIZATION OF KEY CONCEPTS FROM CONTEMPORARY WORKS THAT PROVIDES INSIGHTS THAT MAY SPARK NEW IDEAS

LARGE-SCALE DISTRIBUTED SYSTEMS AND ENERGY EFFICIENCY 2020-06-24

IN THIS WORK THE UNIQUE POWER MEASUREMENT CAPABILITIES OF THE CRAY XT ARCHITECTURE WERE EXPLOITED TO GAIN AN UNDERSTANDING OF POWER AND ENERGY USE AND THE EFFECTS OF TUNING BOTH CPU AND NETWORK BANDWIDTH MODIFICATIONS WERE MADE TO DETERMINISTICALLY HALT CORES WHEN IDLE ADDITIONALLY CAPABILITIES WERE ADDED TO ALTER OPERATING P STATE AT THE APPLICATION LEVEL AN UNDERSTANDING OF THE POWER REQUIREMENTS OF A RANGE OF IMPORTANT DOE NNSA PRODUCTION SCIENTIFIC COMPUTING APPLICATIONS RUNNING AT LARGE SCALE IS GAINED BY SIMULTANEOUSLY COLLECTING CURRENT AND VOLTAGE MEASUREMENTS ON THE HOSTING NODES THE EFFECTS OF BOTH CPU AND NETWORK BANDWIDTH TUNING ARE EXAMINED AND ENERGY SAVINGS OPPORTUNITIES WITHOUT IMPACT ON RUN TIME PERFORMANCE ARE DEMONSTRATED THIS RESEARCH SUGGESTS THAT NEXT GENERATION LARGE SCALE PLATFORMS SHOULD NOT ONLY APPROACH CPU FREQUENCY SCALING DIFFERENTLY BUT COULD ALSO BENEFIT FROM THE CAPABILITY TO TUNE OTHER PLATFORM COMPONENTS TO ACHIEVE MORE ENERGY EFFICIENT PERFORMANCE

EFFICIENT PROCESSING OF DEEP NEURAL NETWORKS 2012-09-04

SURVEYS RESULTS FROM A NEWLY EMERGING LINE OF RESEARCH THAT TARGETS ALGORITHM ANALYSIS IN THE PHYSICAL INTERFERENCE

MODEL THE FOCUS IS ON WIRELESS SCHEDULING AND IT LOOKS AT THE DIFFICULTY OF THIS PROBLEM AND EXAMINES ALGORITHMS FOR WIRELESS SCHEDULING WITH PROVABLE PERFORMANCE GUARANTEES

ENERGY-EFFICIENT HIGH PERFORMANCE COMPUTING 2010

ALTHOUGH THERE ARE MANY BOOKS AVAILABLE ON WSNs MOST ARE LOW LEVEL INTRODUCTORY BOOKS THE FEW AVAILABLE FOR ADVANCED READERS FAIL TO CONVEY THE BREADTH OF KNOWLEDGE REQUIRED FOR THOSE AIMING TO DEVELOP NEXT GENERATION SOLUTIONS FOR WSNs FILLING THIS VOID WIRELESS SENSOR NETWORKS FROM THEORY TO APPLICATIONS SUPPLIES COMPREHENSIVE COVERAGE OF WSNs

EFFICIENCY OF WIRELESS NETWORKS 2013-08-28

THIS INVALUABLE REFERENCE BOOK FOCUSES ON THE AIR INTERFACE OF MOBILE NETWORKS AT DIFFERENT LAYERS ACCORDING TO THE OSI REFERENCE MODEL IT PROVIDES AN OVERVIEW OF SEVERAL WIRELESS COMMUNICATION SYSTEMS AS WELL AS MOBILE SATELLITE SYSTEMS FOLLOWED BY DETAILED ANALYSIS OF RADIO RESOURCE MANAGEMENT ISSUES

WIRELESS SENSOR NETWORKS 2007-05-08

THIS TEXSO CALLED INTENT BASED NETWORKING IBN IS FOUNDED ON WELL KNOWN SDN SOFTWARE DEFINED NETWORKING AND REPRESENTS ONE OF THE MOST IMPORTANT EMERGING NETWORK INFRASTRUCTURE OPPORTUNITIES THE IBN IS THE BEGINNING OF A NEW ERA IN THE HISTORY OF NETWORKING WHERE THE NETWORK ITSELF TRANSLATES BUSINESS INTENTIONS INTO APPROPRIATE NETWORK CONFIGURATIONS FOR ALL DEVICES THIS MINIMIZES MANUAL EFFORT PROVIDES AN ADDITIONAL LAYER OF NETWORK MONITORING AND PROVIDES THE ABILITY TO PERFORM NETWORK ANALYTICS AND TAKE FULL ADVANTAGE OF MACHINE LEARNING THE CENTRALIZED SOFTWARE DEFINED SOLUTION PROVIDES PROCESS AUTOMATION AND PROACTIVE PROBLEM SOLVING AS WELL AS CENTRALIZED MANAGEMENT OF THE NETWORK INFRASTRUCTURE WITH SOFTWARE BASED NETWORK MANAGEMENT MANY OPERATIONS CAN BE PERFORMED AUTOMATICALLY USING INTELLIGENT CONTROL ALGORITHMS ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING AS A RESULT NETWORK OPERATION COSTS APPLICATION RESPONSE TIMES AND ENERGY CONSUMPTION ARE REDUCED NETWORK RELIABILITY AND PERFORMANCE ARE IMPROVED NETWORK SECURITY AND FLEXIBILITY ARE ENHANCED THIS WILL BE A BENEFIT FOR EXISTING NETWORKS AS WELL AS EVOLVED LTE BASED MOBILE NETWORKS EMERGING INTERNET OF THINGS IOT CLOUD SYSTEMS AND SOON FOR THE FUTURE 5G 6G NETWORKS THE FUTURE NETWORKS WILL REACH A WHOLE NEW LEVEL OF SELF AWARENESS SELF CONFIGURATION SELF OPTIMIZATION SELF RECOVERY AND SELF PROTECTION THIS VOLUME CONSISTS OF 28 CHAPTERS BASED ON RECENT RESEARCH ON IBN THE VOLUME IS A COLLECTION OF THE MOST IMPORTANT RESEARCH FOR THE FUTURE INTENT BASED NETWORKING DEPLOYMENT PROVIDED BY DIFFERENT GROUPS OF RESEARCHERS FROM UKRAINE GERMANY SLOVAK REPUBLIC SWITZERLAND SOUTH KOREA CHINA CZECH REPUBLIC POLAND BRAZIL BELARUS AND ISRAEL THE AUTHORS OF THE CHAPTERS FROM THIS COLLECTION PRESENT IN DEPTH EXTENDED RESEARCH RESULTS IN THEIR SCIENTIFIC FIELDS THE PRESENTED CONTENTS ARE HIGHLY INTERESTING WHILE STILL BEING RATHER PRACTICALLY ORIENTED AND STRAIGHTFORWARD TO UNDERSTAND HERewith WE WOULD LIKE TO WISH ALL OUR READERS A LOT OF INSPIRATION BY STUDYING OF THE VOLUME IT WILL BE REPLACED BY THE CORRECT BACKCOVER TEXT AS SOON AS WE GET IT

PROTOCOLS FOR HIGH-EFFICIENCY WIRELESS NETWORKS 2022

WIRELESS NETWORKING COVERS A VARIETY OF TOPICS INVOLVING MANY CHALLENGES THE MAIN CONCERN OF CLUSTERING APPROACHES FOR MOBILE WIRELESS SENSOR NETWORKS WSNs IS TO PROLONG THE BATTERY LIFE OF THE INDIVIDUAL SENSORS AND THE NETWORK LIFETIME FOR A SUCCESSFUL CLUSTERING APPROACH THE NEED OF A POWERFUL MECHANISM TO SAFELY ELECT A CLUSTER HEAD REMAINS A CHALLENGING TASK IN MANY RESEARCH WORKS THAT TAKE INTO ACCOUNT THE MOBILITY OF THE NETWORK IN MOBILE WIRELESS AND SENSOR NETWORKS A CLUSTERING ALGORITHM FOR ENERGY EFFICIENCY AND SAFETY THE AUTHORS USE AN APPROACH BASED ON COMPUTING OF THE WEIGHT OF EACH NODE IN THE NETWORK AS THE PROPOSED TECHNIQUE TO DEAL WITH THIS PROBLEM THEY PRESENT A VIRTUAL LABORATORY PLATFORM VLP OF BAPTIZED MERCURY ALLOWING STUDENTS AND RESEARCHERS TO MAKE PRACTICAL WORK PW ON DIFFERENT ASPECTS OF MOBILE WIRELESS SENSOR NETWORKS THE AUTHORS CHOICE OF WSNs IS MOTIVATED MAINLY BY THE USE OF REAL EXPERIMENTS NEEDED IN MOST COLLEGE COURSES ON WSNs THESE USUAL EXPERIMENTS HOWEVER REQUIRE AN EXPENSIVE INVESTMENT AND MANY NODES IN THE CLASSROOM THE PLATFORM PRESENTED HERE AIMS AT SHOWING THE FEASIBILITY THE FLEXIBILITY AND THE REDUCED COST USING THE AUTHORS APPROACH THE AUTHORS DEMONSTRATE THE PERFORMANCE OF THE PROPOSED ALGORITHMS THAT CONTRIBUTE TO THE FAMILIARIZATION OF THE LEARNERS IN THE FIELD OF WSNs THE BOOK WILL BE A VALUABLE RESOURCE FOR STUDENTS IN NETWORKING STUDIES AS WELL AS FOR FACULTY AND RESEARCHERS IN THIS AREA

FUTURE INTENT-BASED NETWORKING 2019-07-01

MODELING AND SIMULATION OF COMPUTER NETWORKS AND SYSTEMS METHODOLOGIES AND APPLICATIONS INTRODUCES YOU TO A BROAD ARRAY OF MODELING AND SIMULATION ISSUES RELATED TO COMPUTER NETWORKS AND SYSTEMS IT FOCUSES ON THE THEORIES TOOLS APPLICATIONS AND USES OF MODELING AND SIMULATION IN ORDER TO EFFECTIVELY OPTIMIZE NETWORKS IT DESCRIBES METHODOLOGIES FOR MODELING AND SIMULATION OF NEW GENERATIONS OF WIRELESS AND MOBILES NETWORKS AND CLOUD AND GRID COMPUTING SYSTEMS DRAWING UPON YEARS OF PRACTICAL EXPERIENCE AND USING NUMEROUS EXAMPLES AND ILLUSTRATIVE APPLICATIONS RECOGNIZED EXPERTS IN BOTH ACADEMIA AND INDUSTRY DISCUSS IMPORTANT AND EMERGING TOPICS IN COMPUTER NETWORKS AND SYSTEMS INCLUDING BUT NOT LIMITED TO MODELING SIMULATION ANALYSIS AND SECURITY OF WIRELESS AND MOBILES NETWORKS ESPECIALLY AS THEY RELATE TO NEXT GENERATION WIRELESS NETWORKS METHODOLOGIES STRATEGIES AND TOOLS AND STRATEGIES NEEDED TO BUILD COMPUTER NETWORKS AND SYSTEMS MODELING AND SIMULATION FROM THE BOTTOM UP DIFFERENT NETWORK PERFORMANCE METRICS INCLUDING MOBILITY CONGESTION QUALITY OF SERVICE SECURITY AND MORE MODELING AND SIMULATION OF COMPUTER NETWORKS AND SYSTEMS IS A MUST HAVE RESOURCE FOR NETWORK ARCHITECTS ENGINEERS AND RESEARCHERS WHO WANT TO GAIN INSIGHT INTO OPTIMIZING NETWORK PERFORMANCE THROUGH THE USE OF MODELING AND SIMULATION DISCUSSES IMPORTANT AND EMERGING TOPICS IN COMPUTER NETWORKS AND SYSTEMS INCLUDING BUT NOT LIMITED TO

MODELING SIMULATION ANALYSIS AND SECURITY OF WIRELESS AND MOBILES NETWORKS ESPECIALLY AS THEY RELATE TO NEXT GENERATION WIRELESS NETWORKS PROVIDES THE NECESSARY METHODOLOGIES STRATEGIES AND TOOLS NEEDED TO BUILD COMPUTER NETWORKS AND SYSTEMS MODELING AND SIMULATION FROM THE BOTTOM UP INCLUDES COMPREHENSIVE REVIEW AND EVALUATION OF SIMULATION TOOLS AND METHODOLOGIES AND DIFFERENT NETWORK PERFORMANCE METRICS INCLUDING MOBILITY CONGESTION QUALITY OF SERVICE SECURITY AND MORE

MOBILE, WIRELESS AND SENSOR NETWORKS 2015-04-21

UNDERPINNING ALL OF THE IDEAS INVOLVED IN THE GROWTH OF THE INTERNET AND ITS TECHNOLOGIES IS THE PRINCIPLE OF SUBNET DESIGN THIS BOOK TAKES THE PRINCIPLES ON WHICH SUBNET DESIGN IS BASED AND DEVELOPS THEM TO FULLY EXPLAIN THE FUNDAMENTAL DESIGN CONCEPTS ON WHICH MODERN TCP IP NETWORKS DEPEND COMPUTER BOOKS COMMUNICATIONS NETWORKING

MODELING AND SIMULATION OF COMPUTER NETWORKS AND SYSTEMS 2000

CO EDITORS OF THE VOLUME ARE FEDERICO [P] LVAREZ ALESSANDRO BASSI MICHELE BEZZI LAURENT CIAVAGLIA FRANCES CLEARY PETROS DARAS HERMANN DE MEER PANAGIOTIS DEMESTICHAS JOHN DOMINGUE THEO G KANTER STAMATIS KARNOUSKOS SRDJAN KR[P] O LAURENT LEFEVRE JASPER LENTJES MAN SZE LI PAUL MALONE ANTONIO MANZALINI VOLKMAR LOTZ HENNING M[P] LLER KARSTEN OBERLE NOEL E O CONNOR NICK PAPANIKOLAOU DANA PETCU RAHIM RAHMANI DANNY RAZ GA[P] L RICHARDS ELIO SALVADORI SUSANA SARGENTO HANS SCHAFFERS JOAN SERRAT BURKHARD STILLER ANTONIO F SKARMETA KURT TUTSCHKU THEODORE ZAHARIADIS THE INTERNET IS THE MOST VITAL SCIENTIFIC TECHNICAL ECONOMIC AND SOCIETAL SET OF INFRASTRUCTURES IN EXISTENCE AND IN OPERATION TODAY SERVING 2 5 BILLION USERS CONTINUING ITS DEVELOPMENTS WOULD SECURE MUCH OF THE UPCOMING INNOVATION AND PROSPERITY AND IT WOULD UNDERPIN THE SUSTAINABLE GROWTH IN ECONOMIC VALUES AND VOLUMES NEEDED IN THE FUTURE FUTURE INTERNET INFRASTRUCTURES RESEARCH IS THEREFORE A MUST THE FUTURE INTERNET ASSEMBLY FIA IS A SUCCESSFUL CONFERENCE THAT BRINGS TOGETHER PARTICIPANTS OF OVER 150 RESEARCH PROJECTS FROM SEVERAL DISTINCT YET INTERRELATED AREAS IN THE EUROPEAN UNION FRAMEWORK PROGRAMME 7 FP7 THE RESEARCH PROJECTS ARE GROUPED AS FOLLOWS THE NETWORK OF THE FUTURE AS INFRASTRUCTURE CONNECTING AND ORCHESTRATING THE FUTURE INTERNET OF PEOPLE COMPUTERS DEVICES CONTENT CLOUDS AND THINGS CLOUD COMPUTING INTERNET OF SERVICES AND ADVANCED SOFTWARE ENGINEERING THE PUBLIC PRIVATE PARTNERSHIP PROJECTS ON FUTURE INTERNET FUTURE INTERNET RESEARCH AND EXPERIMENTATION FIRE THE 26 FULL PAPERS INCLUDED IN THIS VOLUME WERE SELECTED FROM 45 SUBMISSIONS THEY ARE ORGANIZED IN TOPICAL SECTIONS NAMED SOFTWARE DRIVEN NETWORKS VIRTUALIZATION PROGRAMMABILITY AND AUTONOMIC MANAGEMENT COMPUTING AND NETWORKING CLOUDS INTERNET OF THINGS AND ENABLING TECHNOLOGIES AND ECONOMIC INCENTIVES

SUBNET DESIGN FOR EFFICIENT NETWORKS 2013-04-22

ENERGY EFFICIENCY IS FINALLY A COMMON SENSE TERM NOWADAYS ALMOST EVERYONE KNOWS THAT USING ENERGY MORE EFFICIENTLY SAVES MONEY REDUCES THE EMISSIONS OF GREENHOUSE GASSES AND LOWERS DEPENDENCE ON IMPORTED FOSSIL FUELS WE ARE LIVING IN A FOSSIL AGE AT THE PEAK OF ITS STRENGTH COMPETITION FOR SECURING RESOURCES FOR FUELLING ECONOMIC DEVELOPMENT IS INCREASING PRICE OF FUELS WILL INCREASE WHILE AVAILABILITY OF WOULD GRADUALLY DECLINE SMALL NATIONS WILL BE FIRST TO SUFFER IF CAUGHT UNPREPARED IN THE MIDST OF THE STRUGGLE FOR RESOURCES AMONG THE LARGE PLAYERS HERE IT IS WHERE ENERGY EFFICIENCY HAS A POTENTIAL TO LEAD TOWARD THE NATURAL NEXT STEP TRANSITION AWAY FROM IMPORTED FOSSIL FUELS SOMEONE SAID THAT THE ONLY THING MORE HARMFUL THEN FOSSIL FUEL IS FOSSILIZED THINKING IT IS OUR SINCERE HOPE THAT SOME OF CHAPTERS IN THIS BOOK WILL INFLUENCE YOU TO TAKE A FRESH LOOK AT THE TRANSITION TO LOW CARBON ECONOMY AND THE ROLE THAT ENERGY EFFICIENCY CAN PLAY IN THAT PROCESS

THE FUTURE INTERNET 2012-03-16

THIS BOOK PROVIDES AN OVERVIEW OF THE LATEST RESEARCH AND DEVELOPMENT OF NEW TECHNOLOGIES FOR COGNITIVE RADIO MOBILE COMMUNICATIONS AND WIRELESS NETWORKS THE CONTRIBUTORS DISCUSS THE RESEARCH AND REQUIREMENT ANALYSIS AND INITIAL STANDARDIZATION WORK TOWARDS 5G CELLULAR SYSTEMS AND THE CAPACITY PROBLEMS IT PRESENTS THEY SHOW HOW COGNITIVE RADIO WITH THE CAPABILITY TO FLEXIBLY ADAPT ITS PARAMETERS HAS BEEN PROPOSED AS THE ENABLING TECHNOLOGY FOR UNLICENSED SECONDARY USERS TO DYNAMICALLY ACCESS THE LICENSED SPECTRUM OWNED BY LEGACY PRIMARY USERS ON A NEGOTIATED OR AN OPPORTUNISTIC BASIS THEY GO ON TO SHOW HOW COGNITIVE RADIO IS NOW PERCEIVED IN A MUCH BROADER PARADIGM THAT WILL CONTRIBUTE TO SOLVE THE RESOURCE ALLOCATION PROBLEM THAT 5G REQUIREMENTS RAISE THE CHAPTERS REPRESENT HAND SELECTED EXPANDED PAPERS FROM EAI SPONSORED AND HOSTED CONFERENCES SUCH AS THE 12TH EAI INTERNATIONAL CONFERENCE ON MOBILE AND UBIQUITOUS SYSTEMS THE 11TH EAI INTERNATIONAL CONFERENCE ON HETEROGENEOUS NETWORKING FOR QUALITY RELIABILITY SECURITY AND ROBUSTNESS THE 10TH INTERNATIONAL CONFERENCE ON COGNITIVE RADIO ORIENTED WIRELESS NETWORKS THE 8TH INTERNATIONAL CONFERENCE ON MOBILE MULTIMEDIA COMMUNICATIONS AND THE EAI INTERNATIONAL CONFERENCE ON SOFTWARE DEFINED WIRELESS NETWORKS AND COGNITIVE TECHNOLOGIES FOR IOT

ENERGY EFFICIENCY 2003

FOOD CHAINS QUALITY SAFETY AND EFFICIENCY IN A CHALLENGING WORLD ADDRESSES THE MANY ISSUES FACING EUROPEAN FOOD PRODUCERS AND OTHER FOOD CHAIN STAKEHOLDERS WHO ENDEAVOUR TO IMPROVE THEIR COMPETITIVE POSITION IN A HIGHLY COMPETITIVE WORLD FOOD MARKET THE FOOD CHAIN IS ONE OF THE MAIN ECONOMIC PILLARS IN EUROPE PROVIDING EMPLOYMENT AND OPPORTUNITIES FOR ECONOMIC DEVELOPMENT IN RURAL AREAS IT IS THEREFORE IMPERATIVE TO CONTINUOUSLY MONITOR THE CHANGES THAT AFFECT THE SECTOR IN ORDER TO ALLOW STAKEHOLDERS TO RESPOND PROMPTLY AND EFFECTIVELY TO THE NEW MARKET CONDITIONS ADJUSTING TO THE NEW MARKET INVOLVES NEW TECHNOLOGY GLOBALIZATION DEMOGRAPHIC AND SOCIAL CHANGES WITHIN A CHALLENGING MARKET ENVIRONMENT IN ORDER TO ADOPT THESE NEW MARKET PARAMETERS FOOD CHAIN STAKEHOLDERS NEED TO ADAPT THEIR ACTIVITIES IN ORDER TO GAIN IN TERMS OF EFFECTIVENESS AND EFFICIENCY THIS BOOK WAS ORIGINALLY PUBLISHED AS A SPECIAL ISSUE OF FOOD ECONOMICS ACTA AGRICULTURE SCANDINAVICA SECTION C

FCC RECORD 2018-07-30

THIS BOOK INTRODUCES THE TECHNICAL FOUNDATIONS AND TOOLS FOR ESTIMATING THE POWER CONSUMPTION OF INTERNET NETWORKS AND SERVICES INCLUDING A DETAILED DESCRIPTION OF HOW THESE MODELS ARE CONSTRUCTED AND APPLIED MODELING THE POWER CONSUMPTION AND ENERGY EFFICIENCY OF TELECOMMUNICATIONS NETWORKS CAN BE USED TO GAIN INSIGHT INTO THE CONSTRUCTION OF MATHEMATICAL MODELS THAT PROVIDE REALISTIC ESTIMATES OF THE POWER CONSUMPTION OF INTERNET NETWORKS AND SERVICES THIS KNOWLEDGE ENABLES FORECASTING THE ENERGY FOOTPRINT OF FUTURE NETWORKS AND SERVICES TO INTEGRATE SUSTAINABILITY AND ENVIRONMENTAL CONSIDERATIONS INTO NETWORK PLANNING AND DESIGN FEATURES PROVIDES THE MOTIVATION FOR DEVELOPING MATHEMATICAL MODELS FOR TELECOMMUNICATIONS NETWORK AND SERVICE POWER CONSUMPTION AND ENERGY EFFICIENCY MODELING PRESENTS FACTORS IMPACTING OVERALL NETWORK AND SERVICE POWER CONSUMPTION DISCUSSES THE TYPES OF NETWORK EQUIPMENT AND THEIR POWER CONSUMPTION PROFILES REVIEWS THE BASICS OF POWER MODELING INCLUDING NETWORK SEGMENTATION TRAFFIC FORECASTING TOP DOWN AND BOTTOM UP MODELS WIRED AND WIRELESS NETWORKS DATA CENTERS AND SERVERS EXPLORES THE APPLICATION OF ENERGY EFFICIENCY METRICS FOR EQUIPMENT NETWORKS AND SERVICES THIS BOOK IS AIMED AT STUDENTS AND TECHNOLOGISTS AS WELL AS TECHNOLOGY MANAGERS AND POLICY MAKERS THIS BOOK WILL BE OF VALUE TO ANY ORGANIZATION THAT WISHES TO ESTIMATE THE ENERGY FOOTPRINT OF THE USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGIES THIS BOOK CAN ALSO BE INTEGRATED INTO A COURSE ON THE SUSTAINABILITY OF INFORMATION AND COMMUNICATIONS TECHNOLOGIES

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THIS BOOK COVERS INNOVATIVE TECHNOLOGIES AND APPROACHES FOR IMPROVEMENT OF TECHNICAL AND ECONOMIC PARAMETERS OF FUNCTIONAL GEOTECHNICAL SYSTEMS THE FOCUS IS ON MATHEMATICAL MODELLING OF OBJECTS AND PROCESSES AS WELL AS THE DEVELOPMENT OF TECHNIQUES AND THEIR CONTROL ALGORITHMS THE BOOK COMPRISES SCHEMATA OF PRACTICAL TASKS SOLVING RELATED TO MIN

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