14) BUSINESS APPLICATIONS OF INFORMATION PROCESSING

5459
Seasonal Adjustment and Forecasting in the Presence of Trend, R. W. Horns (Univ. of Leeds); Computer J., vol. 10, pp. 143-149, August 1967.

A general linear statistical model for simultaneous seasonal adjustment and trend estimation is considered for one- and two-term deterministic trend functions. Explicit estimates of the parameters and variances are derived in a convenient computational form from which the properties of these estimates become apparent. In connection with possible uses of the model for forecasting, the Smallest Neighborhood (SN) is introduced, within which the trend is assumed to be either linear or representable by a single term. Examples are given to show that simple techniques in certain situations may yield accurate forecasts in return for a comparatively modest amount of computational effort. A procedure "season" is given which calculates, for any general one term trend function, estimates of seasonal and trend constants together with standard errors and provides predictions, also with standard errors, for any required period.

5460

A computer system utilizing duplexed central processors and three types of satellite computer terminals has been developed for the control of manufacturing processes and product tests. The system was designed for use in a plant producing data processing equipment. The prime objectives of the project were 1) to reduce the time required for the plant to accept new products or product changes, 2) to reduce control and test equipment costs by using standard control and test equipment, and 3) to improve product quality through more uniform processes and tests. The objectives were met by using small, stored-program computer terminals to control individual tests and processes. These terminals are connected to a central computer system which assists with data processing and serves as an input/output device for the terminals. The design and implementation of the system occurred in two phases. During the first phase, the stored-program test terminal, a high-speed data transmission system, and a multiplexer were designed and installed on an IBM 1460 Data Processing System. A programming system was developed concurrently with the hardware. This system included a real-time monitor and application and utility programs which were written for operation in a time-shared environment. During the second phase of development a process control terminal, a data acquisition terminal, and a new multiplexer for duplexing two 1460 Data Processing Systems were designed and implemented. Also developed were shared file control units, an improved transmission system, and programming designed to effectively utilize the power of two computer systems on a real-time basis.

SUBJECT INDEX

A
Adaptive—see Pattern Classification
Algebra—Algebraic
   Boolean Algebra for Producing Compat-
   ible Sequential Machines 5393
   Algebraic Capabilities of a User-Oriented
   Processing System 5429
   Symbolic Algebraic Manipulation 5451
ALGOL
   ALGOL Capabilities of a User-Oriented
   Processing System 5429
Algorithms
   Class Scheduling with Section Preference
   5390
   Minimizing Sequential Machines 5393
   Corner Detection by the Visual Image
   Processor 5399
   Best Linear Chebyshev Approximation
   5436
   Generalizing the Neville-Aitken Method
   of Rational Interpolation 5437
   Polynomial Operations 5438
   Matrix Inversion Using Flow Graphs 5439
   Analog Computers
   Parallel Analog Processors of Random
   Pulse Sequences 5453
   Analog Storage
   Nondestructive Read-Out Magnetic Core
   Analog Memory 5454
   De Reset Magnetic Core Analog Memory
   5455
   Long-Term Analog Storage Circuit 5456
   Circuit for Canceling Drift of Viscous-
   Type Analog Memory Elements 5456
Approximation—see Chebyshev Approxima-
   tion, Interpolation
Arithmetic Operations
   Arithmetic Operations with Random
   Pulse Sequences 5453
Arrays
   Nondestructive Read-Out Ferrite Core
   Storage Array 5408
   Nondestructive Read-Out Magnetic Film
   Storage Array 5410
   Inductive Storage Using a Solenoid Array
   5414
   Densely Packed Arrays of Electron Beam
   Addressable Storage Elements 5417
Art
   Computer Generated Artistic Visual
   Images 5433
   Artificial Intelligence—see Learning
   ASCII Code
   Keyboard Generation of Coded Tone Se-
   quences Representing ASCII Alphabetic
   Characters 5418
Associative
   Nondestructive Read-Out Technique for
   Associative Memories 5416
   Associative Processing System for Con-
   ventional Digital Computers 5429
Batch Fabrication
   Solenoid-Coupled Batch-Fabricated Read-
   Only Memory Array 5414
   Batch Fabrication of Cryoelectric Mass
   Memories 5415

B
Cathode Rays
   Three Cathode-Ray Electrostatic Data
   Storage System 5399
   Cathode-Ray Tube Display Consoles 5419
   Cathode-Ray Film Scanner 5452
Chebyshev Approximation
   Algorithms for the Best Linear Chebyshev
   Approximation 5436
Circuits
   Long-Term Analog Storage Circuit Using
   a Sampling Technique 5456
   Circuit for Canceling Drift of Viscous-
   Type Analog Memory Elements 5456
   —see also Integrated Circuits, Networks
   Codes
   Processing of Interpretive Code Using
   Microprogramming 5428
   New Classes of Synchronous Codes 5448
Coding
   Universal Encoding of Asynchronous Se-
  quential Networks 5395
   Pulse-Rate Analog Coding 5453
Communications
   Tone Sequences Generated by Data Com-
   munications Terminals in Time-Sharing
   Systems 5418
   Future Use of Computers in the Terminals
   of Communication Systems 5450
   Compilers
   Microprogrammed Compiler 5428
   Computer Systems
   Evaluating Computer Systems Through
   Simulation 5397
ABSTRACTS OF CURRENT COMPUTER LITERATURE

Criteria for Designing Computer Systems 5398
Microprogrammed Implementation of EXPLORER on IBM System/360 Model 30 5428
Use of On-Line Time-Shared Multiple-Console Computer Systems for Simulation and Gaming 5447
Remote Access Computing System Using Twelve-Key Keyboard Telephones as Terminals 5449

Computers

—see Analog Computers, Data Processing, Digital Computers, Multiprocessing, Processors, Time Sharing

Conic Sections

Conic Section Display Generator Using Multiplying Digital-Analog Converters 5420

Converters

Conic Section Display Generator Using Multiplying Digital-Analog Converters 5420
Resistive Digital-to-Analog Conversion Ladders 5457

Coordinate Systems

Computer Formulation of the Equations of Motion in Various Coordinate Systems 5451

Costs

Cost Effectiveness of Monoprogrammed, Multiprogrammed and Multiprocessing Digital Computers 5426

Counters

500-MHz Tunnel Diode-Transistor Current Mode Ring Counter 5406

Creativity

Digital Computer as a Creative Medium 5433

Cryotron Storage

Cryotron-Based Random Access Memory 5415
—see also Superconductive Storage

CSS Programming Language

Use of CSS for Computer System Simulation 5397

Data Compression

Data Compression in Files 5424
Implications of Data Compression for Automatic Programming Systems 5424

Data Processing

Shipboard Oceanographic Data Processing and Control System 5400
Computer-Operated Manufacturing and Product Test System for Data Processing Equipment 5460

—see also Digital Computers, Educational Data Processing, Multiprocessing, Processors

Data Structures

Linked-List Data Structure for Graphic Display 5419

Data Transmission

Transmission of Alphanumeric Information Using a Numeric Keyboard 5449
Programmed Scanner for Eliminating Ambiguity in Data Transmission 5449

Decision Tables

Introduction to Decision Tables 5421

Decoders

Graphical Display Generator Using Multiplying Decoders 5420

—see also Converters

Derivatives

Dynamic Computation of Derivatives 5441

Design

Criteria for Designing Computer Systems 5398

Deterministic Design of Fail-Safe Logical Systems 5402

Diagnosis

Mathematical Model for Diagnosing System Failures 5396

—see also Malfunctions

Differential Equations (Ordinary)

Numerical Integration of Systems of Ordinary Differential Equations with Widely Separated Eigenvalues 5442

Generalized Crank–Nicholson Technique for Solving Simultaneous Ordinary Differential Equations 5443

Differentiation

Symbolic Differentiation 5451

Digital Computers

Portable SNUPER Computer for Evaluating Computer System Performance 5398

Visual Image Processor Computer 5399

DREAC Drum Experimental Automatic Computer 5401


A

Algorithm for Class Scheduling with Section Preference 5390

Electron Beam Storage

Electron Beam Addressable Storage Elements of Micron Size 5417

Electrostatic Storage

Electrostatic Data Storage System 5399

Error Control

Error Control Problems in Multiprocessing Systems 5425

Error Correction

Error Correction in Logical Design 5402

Error Correction Procedures for Linear Pattern Classifiers 5434

EUCLOR Algorithmic Language

Microprogrammed Implementation of EUCLOR 5428

Executive Systems

Markovian Model of an Executive System 5430

—see also Operating Systems

Extrapolation

Extrapolation Method for Hybrid Simulation 5446

F

Failures

Mathematical Model for Diagnosing System Failures 5396

Logical Design of Fail-Safe Logical Systems 5402

—see also Reliability

Files

Data Compression in Files 5424
Films—see Magnetic Films

Flow Graphs

Algorithm for Matrix Inversion Using Flow Graphs 5439

Flow Tables

Flow Table Hypercube Assignments for Asynchronous Sequential Networks 5395

Forecasting

Statistical Model for Forecasting in the Presence of a Trend 5459

G

Games

Use of On-Line Time-Shared Multiple-Console Computer Systems for Gaming 5447

Generators—see Displays, Noise Generators, Sequence Generators, Waveform Generators

Graphs

State Transition Graphs of Autonomous Sequential Machines 5394

—see also Flow Graphs

I

Images

Visual Image Processor Computer 5399

Computer Generated Artistic Visual Images 5433

Instruction Registers

Optimal Index Register Allocation in Straight-Line Programs 5422

Input

Portable Electronic Keyboard for Computer Input by Telephone 5418

Graphic Input Devices; Electronic Pans 5419

Inductive Storage

Inductive Storage Using a Solenoid Array 5414

Information Centers

Information Center Based on Computerized Television 5450

Instrumentation

Instrumentation for Measuring Computer System Performance 5398

Integrated Circuits

Electromagnetic Compatibility in Digital Integrated Logic Circuits 5403

NDRO Film Memories Compatible with Integrated Circuits 5410

Diode Access Plated-Wire Memory Compatible with Integrated Circuits 5413

Integration

Numerical Integration of Systems of Ordinary Differential Equations with Widely Separated Eigenvalues 5442

D
Interpolation
Algorithms for Generalizing the Neville-Aitken Method of Rational Interpolation 5437
Interpolation Methods for Digital Simulation 5446
Interpreters
Microprogrammed String Language Interpreter 5428

J
joss System
joss System Simulation of a Tactical Air Control System 5447

K
Keyboards
Portable Electronic Keyboard for Computer Input by Telephone 5418
Remote Access Computing Systems Using Twelve-Key Keyboard Telephones as Terminals 5449

L
Ladder Networks
Synthesis of Resistive Digital-to-Analog Conversion Ladder Networks 5457
Learning
Bayes Strategy for Machine Learning 5435
Light Pens
Graphic Input Devices; Electronic Pens 5419
Linear Programming
Linear Programming Formulation of Chebyshev Approximation 5456
Logic
Electromagnetic Compatibility in Digital Integrated Logic Circuits 5403
DTPL Magnetic Thin Film Logic Devices 5404
—see also Threshold Logic

M
Magnetic Core Storage
Shmoo Plot for a Ferrite Core Coincident Current Memory 5407
80 ns Nondestructive Read-Out Ferrite Core Storage Array 5408
Nondestructive Readout Magnetic Core Analog Memory 5454
De Reset Magnetic Core Analog Memory 5455
Magnetic Cores
Speed Capabilities of Ferrite Cores in Nondestructive Read-Out Operation 5405
Magnetic Domains
Threshold Fields for Magnetic Domain Tip Propagation 5404
Magnetic Drum Storage
DREAC Drum Experimental Automatic Computer 5401
Magnetic Drum Store Used with the DAD Operating System 5431
Magnetic Film Storage
DTPL Magnetic Thin Film Storage and Logic Devices 5404
Thermal Cycle-Time and READ Bandwidth of Magnetic Film Memories 5409
Magneto optic Interrogation of a Magnetic Film Memory 5409
Magnetic Film Storage Array 5410
READ-Only Magnetic Film Waffle Iron Memory 5411
Magnetic Wire Storage
Storage Based on Magnetic Wires with Re-Entrant Hysteresis Loops 5412
High-Speed Flaked-Wire Random Access Storage System 5413
Manufacturing
Computer-Operated Manufacturing System for Data Processing Equipment 5460
Mass Storage
Batch Fabrication of Cryoelectric Mass Memories 5415
Mathematical Programming
Language for Solving Large-Scale Mathematical Programming Systems 5444
—see also Linear Programming
Matrices
Weight Matrix Representation of a Threshold Logic Network 5391
Standard Matrix Routines 5432
Algorithm for Matrix Inversion Using Flow Graphs 5439
Measurement
Instrumentation for Measuring Computer System Performance 5398
Memory—see Storage
Microprogramming
Microprogrammed Implementation of FLEX 5428
Processing of Interpretive Code Using Microprogramming 5428
Minimization
Minimization of Sequential Machines 5393
Models
Mathematical Model for Diagnosing System Failures 5396
Model of Channeled Domain Tip Propagation 5404
Mathematical Model of an Executive System 5438
Program for Forming Mathematical Models 5432
Language for Modeling Dynamic System 5445
Statistical Model for Simultaneous Seasonal Adjustment and Trend Estimation 5439
Monte Carlo
Combined Stochastic and Monte Carlo Algorithm for Assignment of Students to Classes 5390
Multiprocessing
Simulation of Multiprocessing Systems 5397
Memory Protection in Multiprocessing Systems 5425
Throughput and Cost Effectiveness of Multiprogrammed Digital Computers 5426
—see also Time Sharing
Music
Computer Music 5433

N
Networks
Weight Matrix Representation of a Threshold Logic Network 5391
Reliable Logical Networks 5402
—see also Ladder Networks, Sequential Machines
Neuromime Systems
Comparison Between Random Pulse Processors and Neuromime Systems 5453
Noise Generators
Pseudo noise Generators 5392

O
Oceanography
Shipboard Oceanographic Data Processing and Control System 5400
On-Line
Combined On-Line and Off-Line Oceanographic Computations 5400
Use of On-Line Time-Shared Multiple-Console Computer Systems for Simulation and Gaming 5447
Supervisory Real-Time Control of Remote Manipulation 5458
Operating Systems
Design and Implementation of the DAD Operating System 5431
—see also Executive Systems
Optical
Magneto optic Interrogation of a Magnetic Film Memory 5409
Optimal
Optimal Search Policies for Malfunctions 5396
Optimal Index Register Allocation in Straight-Line Programs 5422

P
Pattern Classification
Theory of Adaptive Pattern Classifiers 5434
Programs for Implementing a Method of Statistical Pattern Classification 5435
Polynomials
Generation of Polynomial Discriminant Functions for Statistical Pattern Recognition 5435
Algorithm for Polynomial Operations 5438
Processing; Processors
Visual Image Processor Computer 5399
Solenoid-Coupled Batch-Fabricated READ-Only Memory Array for a Processor Controller 5414
Software Structure of Graphic Processors 5419
Processing of Interpretive Code Using Microprogramming 5428
Random-Pulse Processors 5453
—see also Associative, Computers, Multiprocessing
Programming
Implications of Data Compression for Automatic Programming Systems 5424
ABSTRACTS OF CURRENT COMPUTER LITERATURE

Throughput and Cost Effectiveness of Nonopportunized, Multiprogrammed and Multiprocessing Digital Computers 5436

State-Variable Programming Methods 5446

Programmed Scanner for Eliminating Ambiguity in Data Transmission 5449 —see also Mathematical Programming, Microprogramming, Multiprogramming, Software

Programming Languages

Special Purpose Language Required for Computer System Simulation 5397

Language for Associative Retrieval Requests 5429

Language for Solving Large-Scale Mathematical Programming Systems 5444

Language for Modeling and Simulating Dynamic Systems 5445

Language for Facilitating Symbolic Mathematical Computation 5451 —see also ALGOL, CSS, EULER, LOMUSS, String Languages

Programs

Programs for Simulating Computer Systems 5397

Picture Modification Programs for Graphic Processors 5419

Optimal Index Register Allocation in Straight-Line Programs 5422

Compaction Procedure for Dynamic Storage Allocation Programs 5423

Standard Matrix Routines 5432

Program for Forming Mathematical Models 5432

Programs for Implementing a Method of Statistical Pattern Classification 5435

Program for Polynomial Operations 5438

Sequential Machines

Binary Linear Sequential Machines 5392

Compatibility and Minimization of Sequential Machines 5393

Classification and Enumeration of Autonomous Sequential Machines 5394

State Transition Graphs of Autonomous Sequential Machines 5394

UniversalEncoding of Asynchronous Sequential Networks 5395

Ships

Shipboard Oceanographic Data Processing and Control System 5400

Simulation

Simulation of Time-Sharing, Multiprogramming, and Multiprocessing Systems 5397

Language for Simulating Dynamic Systems 5445

State-Space Methods of Simulating Continuous Fixed Linear Systems 5446

Use of On-Line Time-Shared Multiple-Console Computer Systems for Simulation 5447

Software

Software Structure of Graphic Processors 5419

Software for Statistical Analysis of Data 5432

—see also Programming, Programs

Solenoid Storage

Solenoid-Coupled Batch-Fabricated Read-Only Memory Array 5414

Space Flight

Supervisory Real-Time Control of Remote Manipulation During Space Flight 5458

Spark Chambers

Spark Chamber Film Reader 5452

Statistics

Markovian Model of an Executive System 5430

Software for Statistical Analysis of Data 5432

Generation of Polynomial Discriminant Functions for Statistical Pattern Recognition 5435

Statistical Model for Simulated Seasonal Adjustment and Trend Estimation 5459

—see also Stochastic Processes

Stochastic Processes

Combined Stochastic and Monte Carlo Algorithm for Assignment of Students to Classes 5390

Arithmetic Operations with Random Pulse Sequences 5453

Use of Threshold Logic Gates as Processors of Random Pulse Sequences 5453

—see also Noise Generators

Storage

Compaction Procedure for Variable-Length Storage Elements 5423

Memory Allocation in Multiprocessing Systems 5425

—see also Analog Storage, Cathode Rays, Cylindrical Storage, Electron Beam Storage, Electrostatic Storage, Inductive Storage, Magnetic Core Storage, Magnetic Drum Storage, Magnetic Film Storage, Magnetic Wire Storage, Superconducting Storage, Associative Storage

Storage Allocation

Compaction Procedure for Dynamic Storage Allocation Programs 5423

Storage Allocation in Multiprocessing Systems 5425

Storage Protection

Memory Protection in Multiprocessing Systems 5425

String Languages

Microprogrammed String Language Interpreter 5428

Superconductive Storage

Flux Shuttling Nondestructive Readout of Superconductive Memory Cells 5416 —see also Cryostorage

Symbolic Languages

Language for Facilitating Symbolic Mathematical Computation 5451

Symbolic Algebraic Manipulation and Differentiation 5451

Systems

Mathematical Model for Diagnosing System Failures 5396

Evaluating Computer Systems Through Simulation 5397

Portable SUPER Computer for Evaluating Computer System Performance 5398

Associative Processing System for Conventional Digital Computers 5429

Language for Modeling and Simulating Dynamic Systems 5445

State-Space Methods of Simulating Continuous Fixed Linear Systems 5446

—see also Communications, Computer Systems, Executive Systems, Multiprocessors, Operating Systems

Switching Functions

Synthesis of Symmetric Switching Functions Using Threshold Logic 5391

T

Telephones

Portable Electronic Keyboard for Computer Input by Telephone 5418

Telephone Time Sharing System 5449

Remote Access Computing System Using Twelve-Key Keyboard Telephones as Terminals 5449

Television

Association of Computers and Closed Circuit Television 5450

Information Center Based on Computerized Television 5450

Terminals

Tone Sequences Generated by Data Communications Terminals in Time-Sharing Systems 5418

Introduction to Computer Graphic Terminals 5419

Remote Access Computing System Using Twelve-Key Keyboard Telephones as Terminals 5449

Future Use of Computers in the Terminals of Communication Systems 5450

Use of Stored Program Computer Terminals for Production Quality Control 5460

Threshold Elements

Properties of Adaptive Threshold Elements Used for Statistical Pattern Recognition 5435

Threshold Logic

Synthesis of Symmetric Switching Functions Using Threshold Logic 5391

Weight Matrix Representation of a Threshold Logic Network 5391

Q

Quality Control

Use of Stored Program Computer Terminals for Production Quality Control 5460

R

Random Processes —see Stochastic Processes

Real-Time —see On-Line

Redundancy

Redundancy in Logical Design 5402

Reliability

Reliable Logical Networks 5402 —see also Failures

Retrieval

Language for Associative Retrieval Requests 5429

S

Scanners

Programmed Scanner for Eliminating Ambiguity in Data Transmission 5449

Cathode Ray Film Scanner 5452

Scheduling

Algorithm for Class Scheduling with Section Preference 5390

Search

Optimal Search Policies for Malfunctions 5396

Sequence Generators

Computation of Time-Phase Displacements of Binary Linear Sequence Generators 5392
Use of Threshold Logic Gates as Processors of Random Pulse Sequences 5453

Throughput

Throughput of Monoprogrammed, Multiprogrammed, and Multiprocessing Digital Computers 5426

Time-Sharing

Simulation of Time-Sharing Systems 5397

Combined On-Line and Off-Line Oceanographic Computations with Time-Sharing 5400

Tone Sequences Generated by Data Communications Terminals in Time-Sharing Systems 5418

User Performance in Time-Shared Computer Systems 5427

Use of On-Line Time-Shared Multiprocessor Computer Systems for Simulation and Gaming 5447

Trees

Partitioning of State Transition Graphs into Functional Rooted Trees 5394

V

Voice Answer-Back

Communicating with Machines with Voice Answer-Back Capabilities 5418

W

Waffle Iron Storage

READ-Only Magnetic Film Waffle Iron Memory 5411

Waveform Generators

Waveform Generator for Display Systems 5420

AUTHOR INDEX

A
Aaron, M. R. 5457
Amari, S. 5434
Austin, B. J. 5431
Aviles, J. F. 5411
B
Bonyhard, P. I. 5412
Bosch, L. J. 5408
Bourrez, J. M. 5411
Bowin, C. O. 5400
Brown, G. H. 5450
Busan, V. A. 5390
C
Carides, T. 5452
Carruth, D. E. 5401
Chu, W. W. 5396
Clague, D. J. 5448
Cocquard, J. M. 5411
Coggan, B. 5398
Colley, L. E. 5392
Conway, R. W. 5449
Cosentino, L. S. 5415
Cottingham, J. G. 5452
Covaleski, J. F. 5405
Crocker, S. D. 5398
D
davison, E. J. 5443
E
Estrin, G. 5398
Even, R. K. 5439
F
Feldman, J. A. 5429
Feltman, A. V. 5452
Ferrell, W. R. 5458
Flaker, R. C. 5408
Foley, J. D. 5430
Fowler, M. E. 5442
Fraser, A. G. 5434
Friedlaender, P. J. 5454
G
Gogos, B. 5407
Goldberg, R. P. 5397
Greenspan, D. 5440
Grossman, A. S. 5452
H
Haddon, B. K. 5423
Hamblin, C. L. 5438
Harada, K. 5453
Harbourt, C. O. 5456
Horns, R. W. 5459
Holden, T. S. 5431
Hopkins, D. 5398
Hottenrott, H. G. 5408
Howard, J. C. 5451
Hsia, Y. 5414
Hudson, R. H. 5431
Huesmann, L. R. 5397
K
Kawano, T. 5455
Kelly, J. 5417
King, P. J. H. 5421
Koehler, H. F. 5405
Koga, Y. 5402
Krannsow, H. S. 5445
L
Larkin, F. M. 5437
Leipuner, L. B. 5452
Lesk, A. M. 5441
Lewin, M. H. 5418, 5419
Lipovski, G. J. 5393
Lockhart, N. F. 5408
Lucio, F. 5422
M
Madigan, J. R. 5400
Marinussi, J. G. 5452
Mayer, W. N. 5410
McMilen, J. D. 5454
Meunier, P. J. 5411
Mine, H. 5402
Mitra, S. K. 5457
Morgan, H. L. 5449
N
Nagle, E. M. 5416
Nathan, A. 5439
Nelson, Jr., R. L. 5456
Noll, A. M. 5433
Northrop, G. M. 5447
O
O'Brien, W. 5432
Osborne, M. R. 5436
P
Parente, R. J. 5445
Pinsky, P. 5444
Pohm, A. V. 5410
R
Ribeiro, S. T. 5453
Roberts, L. G. 5420
Roder, J. 5425
Rogers, K. T. 5417
Rosen, A. F. 5425
Rovner, P. D. 5429
Roay, P. K. S. 5391
Russell, J. K. 5399
Ryan, H. F. 5394
S
Sackman, H. 5427
Sass, A. R. 5414, 5416
Saucier, G. 5395
Schwender, G. E. 5452
Sheridan, R. B. 5458
Smay, T. A. 5410
Smith, D. O. 5409
Spain, R. J. 5404
Specht, D. F. 5435
Stewart, W. C. 5415
Stuehler, J. E. 5460
T
Tan, Z. C. 5406
U
Ungar, E. D. 5400
V
Valentino, A. R. 5403
Van Khai, T. 5411
W
Waaben, S. 5413
Walt, J. V. 5446
Walt, W. M. 5423
Wald, B. 5426
Warten, R. M. 5442
Watkins, R. V. 5460
Watson, G. A. 5436
Weber, H. 5428
Z
Zagursky, J. J. 5407