Operations Research 2005-06

Operations Research (OR) is the use of scientific methodology in studying those systems whose design or operation requires human decision-making. OR provides the means for making the most effective decisions, some of which are mainly concerned with design, while others are mainly operational in nature. The strength and versatility of OR stems from its diagnostic power through observation and modeling, as well as from its prescriptive power through analysis and synthesis. The techniques used are continually being improved and expanded, with the aid of both basic and applied research.

OR is interdisciplinary in nature, drawing on and contributing to techniques from many fields, including the mathematical sciences, engineering, economics, and the physical sciences. OR practitioners have successfully solved a wide variety of real-world problems, varying from the optimal design of telecommunications networks in the face of uncertain demand, to the planning for an optimal deployment of armed forces during wartime. Operations researchers have found employment in academia, industry and government, as well as in the military (where OR originated during World War II). Most importantly, new applications are continually arising, with many originating from recent societal problems, such as supply chain management, health maintenance, environmental pollution control, software production, and financial engineering. The interdisciplinary nature of Operations Research is reflected in the OR program at NC State University. The faculty members who constitute the program have their academic appointments in a large variety of departments not only in the Colleges of Engineering and Physical and Mathematical Sciences, but also in the colleges of Natural Resources, Management, and Textiles.

OPERATIONS RESEARCH FACULTY

John W. Baugh Jr., Professor of Civil Engineering and Computer-Aided Engineering (919.515.7697); PhD Carnegie Mellon University; Development of concurrent and distributed algorithms and systems; mathematical modeling, optimization, and support for engineering design. [john.baugh@ncsu.edu]

Richard H. Bernhard, Professor of Industrial Engineering (919.515.6423); PhD Cornell University; Engineering economics, cost analysis control, decision theory. [bernhar@eos.ncsu.edu]

Bibhuti B. Bhattacharyya, Professor of Statistics (919.515.1937); PhD London School of Economics; Statistical theory, inference, stochastic processes. [bhattach@stat.ncsu.edu]

John W. Bishir, Professor of Mathematics (919.515.2595); PhD NC State University; Probability theory, stochastic processes, modeling of biological processes. [bishir@math.ncsu.edu]

E. Downey Brill, Professor of Civil Engineering (919.515.2331); PhD The Johns Hopkins University; Modeling and analysis of environmental systems (water, air, and solid waste systems). Modeling to evaluate management strategies for environmental systems. Role of optimization models in decision making and policy analysis. [brill@eos.ncsu.edu]

Robert Buche, Assistant Professor of Mathematics (919.515.7453); Stochastic approximation, stochastic control, mathematical modeling and analysis of queueing and communication systems (wired and wireless), large deviations, applied probability. [rtbuche@unity.ncsu.edu]

Stephen L. Campbell, Professor of Mathematics (919.515.3300); PhD Northwestern University; Control theory, Numerical analysis. [slc@math.ncsu.edu]

Xiuli Chao, Professor of Industrial Engineering and Co-Director of Operations Research (919.515.3295); PhD Columbia University; Queuing networks, sequencing and scheduling, inventory theory, financial engineering, supply chain management, and logistics systems. [xchao@eos.ncsu.edu]

Rada Chirkova, Assistant Professor of Computer Science (919.513.3506); PhD Stanford University, 2002; Database and query performance, materialization of views and indexes, database theory. [chirkova@csc.ncsu.edu]

Mike Devetsikiotis, Associate Professor of Electrical and Computer Engineering (919.515.5253); PhD North Carolina State University; High-speed network modeling, performance evaluation and efficient simulation; and optimization techniques applied to the analysis and design of communication systems. [mdevets@eos.ncsu.edu]

Joseph C. Dunn, Professor Emeritus of Mathematics (919.515.7891); PhD Adelphi University; Nonlinear optimization, optimal control. [joe_dunn@ncsu.edu]

Salah E. Elmaghraby, University Professor of Industrial Engineering and Operations Research (919.515.7077); PhD Cornell University, 1958; Production systems, scheduling, networks. [elmaghra@eos.ncsu.edu]

Shu-Cherng Fang, Walter Clark Professor of Industrial Engineering and Professor of Operations Research (919.515.2192); PhD Northwestern University, 1979; Large scale linear and nonlinear programming, entropy and fuzzy optimization, operations research. [fang@eos.ncsu.edu]

Yahya Fathi, Professor of Industrial Engineering and Co-Director of Operations Research (919.515.6417); PhD University of Michigan, 1979; Mathematical programming, production planning and scheduling, quality engineering. [fathi@eos.ncsu.edu]

Jean-Pierre Fouque, Professor of Mathematics and Director of Financial Mathematics (919.515.8588); PhD University Pierre et Marie Curie; Stochastic processes, stochastic partial differential equations, waves in random media, financial mathematics. [fouque@math.ncsu.edu]

Robert E. Funderlic, Professor of Computer Science (919.515.7775); PhD University of Tennessee, 1970; Scientific computing including the design and implementation of algorithms for parallel computers; design and analysis of numerical methods especially in numerical linear algebra. [ref@adm.csc.ncsu.edu]

Subhashis Ghosal, Assistant Professor of Statistics (919.513.0190); PhD Indian Statistical Institute; Nonparametric Bayesian analysis, nonparametric curve estimation

and testing, Bayesian asymptotics, nonregularity, limit theorems in probability. [ghosal@stat.ncsu.edu]

Robert Handfield, Bank of America University Distinguished Professor of Supply Chain Management and Director of Supply Chain Resource Consortium (919-515-4674); PhD UNC-Chapel Hill; Supply chain management. [Robert_Handfield@ncsu.edu]

Robert E. Hartwig, Professor of Mathematics (919.515.2385); PhD The University of Adelaide, Australia; Linear algebra, linear programming, numerical linear algebra. [hartwig@math.ncsu.edu]

Thom J. Hodgson, James T. Ryan Professor of Industrial Engineering, Distinguished University Professor of Industrial Engineering, and Director of the Integrated Manufacturing Systems Engineering Institute (919.515.5194); PhD University of Michigan, 1970; Scheduling theory, production control, inventory theory, automated production. [hodgson@eos.ncsu.edu]

Duncan M. Holthausen, Professor of Management (919.513.2882); PhD Northwestern; Decision theory, mathematical economics. [duncan_holthausen@ncsu.edu]

Thomas L. Honeycutt, Associate Professor of Computer Science (919.515.7001); PhD North Carolina State University, 1969; Management information systems, computer modeling and simulation, computer literacy. [honeycutt@csc.ncsu.edu]

Ilse Ipsen, Professor of Mathematics (919.515.3399); PhD The Pennsylvania State University, 1983; Numerical linear algebra including solution of systems of linear equations, eigenvalue and singular value problems. [ipsen@math.ncsu.edu]

Kazufumi Ito, Professor of Mathematics (919.515.7140); PhD Washington University, 1981; Control theory and inverse problems and theoretical and numerical analysis for solutions to PDEs. [kito@math.ncsu.edu]

Jeffrey A. Joines, Assistant Professor of Textiles (919.513.4188); PhD North Carolina State University, 1996; Optimization of complex systems, including developing efficient stochastic search algorithms; utilizing traditional search methods; using and developing object-oriented simulation languages; and applying all these techniques to the design, control, and analysis of manufacturing and production systems. [jeffjoines@ncsu.edu]

Michael G. Kay, Associate Professor of Industrial Engineering (919.515.2008); PhD North Carolina State University, 1992; Logistics, genetic algorithms, metaheuristics, facilities design, material handling, multisensor integration and fusion, intelligent machines and systems. [kay@ncsu.edu]

Carl Timothy Kelley, Drexel Professor of Mathematics (919.515.7163); PhD Purdue University; Optimal control, nonlinear optimization, multilevel methods. [tim_kelley@ncsu.edu]

Russell E. King, Professor of Industrial Engineering (919.515.5186); PhD University of Florida; Stochastic processes, automated production, real-time control. [king@eos.ncsu.edu]

John E. Lavery, Program Director of Army Research Office; PhD University of Maryland; Optimization, modeling of complex systems, computational methods. [lvery@aro.arl.army.mil]

Zhilin Li, Associate Professor of Mathematics (919.515.3210); PhD University of Washington; Numerical methods for hyperbolic systems, level set methods and immersed finite element techniques, multigrid methods for interface problems. [zhilin@eos.ncsu.edu]

George F. List, Professor of Civil Engineering (919.513.7915); PhD University of Pennsylvania, 1984; Transportation system observability, control and network planning. [gflist@ncsu.edu]

David F. McAllister, Professor of Computer Science (919.515.7971); PhD University of North Carolina, Chapel Hill, 1972; Computer graphics and imaging, true 3D display, curve and surface representation and fault-tolerant software reliability. [mcallister@csc.ncsu.edu]

Negash Medhin, Professor of Mathematics (919.513.3585); PhD Purdue University; Optimal control theory, smart material structure (molecular-based models for hysteresis), dynamical systems, stochastics. [ngmedhin@unity.ncsu.edu]

Carl D. Meyer, Professor of Mathematics (919.515.2384); PhD Colorado State; Numerical analysis, matrix computations, Markov chains. [meyer@math.ncsu.edu]

Arne A. Nilsson, Professor of Electrical and Computer Engineering; Technical Director of the Center for Advanced Computing and Communications (919.515.5130); PhD Telecommunication Systems (Teknologie Doktor) Lund University of Technology, Sweden, 1976; Routing and flow control in computer networks, performance modeling of local area networks, computer communication synthesis and analysis, performance modeling of computer systems, medical image networking, and packed radio architectures. [nilsson@eos.ncsu.edu]

Henry L.W. Nuttle, Professor of Industrial Engineering (919.515.2364); PhD John Hopkins University, 1968; Planning, scheduling, and control, operations research. [nuttle@eos.ncsu.edu]

Tao Pang, Assistant Professor of Mathematics (919.513.2110); PhD Brown University, 2002; Financial mathematics, stochastic control theory. [tpang@unity.ncsu.edu]

Harry G. Perros, Professor of Computer Science (919.515.2041); PhD Trinity College Dublin, Ireland, 1975; Performance analysis of high-speed communication systems, new queueing network modeling tools, simulation techniques, and numerical analysis. [hp@csc.ncsu.edu]

S. Ranji Ranjithan, Associate Professor of Civil Engineering (919.515.6979); PhD University of Illinois at Urbana-Champaign, 1992; Mathematical modeling and optimization, evolutionary computation, systems analysis, computer-based decision support tools, decision making under uncertainty, artificial neural networks. [ranji@eos.ncsu.edu]

Thomas W. Reiland, Associate Professor of Statistics (919.515.1939); PhD Florida State University; Nonsmooth analysis, nondifferentiable programming. [reiland@stat.ncsu.edu]

Stephen D. Roberts, Professor of Industrial Engineering (919.515.6400); PhD Purdue University, 1968; Simulation language design, simulation modeling, software engineering. [roberts@eos.ncsu.edu]

Joseph P. Roise, Professor of Forestry (919.515.7783); PhD University of Washington; Forest and natural resources management science, production and manufacturing analysis, scheduling. [joe_roise@ncsu.edu]

George N. Rouskas, Professor of Computer Science (919.515.3860); PhD Georgia Institute of Technology, 1994; Lightwave high-speed networks, distributed systems, multicasting, and their performance evaluation. [rouskas@csc.ncsu.edu]

Carla D. Savage, Professor of Computer Science (919.515.7863); PhD University of Illinois, 1977; Algorithm design for parallel architectures, combinatorial algorithms, graph theory and discrete mathematics. [cds@csc.ncsu.edu]

Munindar P. Singh, Associate Professor of Computer Science (919.515.5677); PhD University of Texas at Austin; Smart phone and communicator applications, referral systems, B2B interoperation, trading and payment protocols, and trust. [singh@ncsu.edu]

Kartik K. Sivaramakrishnan, Assistant Professor, Department of Mathematics (919.513.7445); PhD Rensselaer Polytechnic Institute, 2002; Theory, algorithms, and applications of convex optimization including linear, second order, and semidefinite programming; interior point methods; and decomposition and nonsmooth approaches for large scale optimization. [kksivara@ncsu.edu]

Charles E. Smith, Associate Professor of Statistics (919.515.1907); PhD Chicago; Applied probability and stochastic processes, biological models, level crossing problems. [cesmith@stat.ncsu.edu]

Ralph C. Smith, Professor of Mathematics and Co-Director of Operations Research (919.515.7552); PhD Montana State University, 1990; Mathematical modeling of smart material systems, numerical analysis and scientific computation for physical systems, parameter estimation and control in partial differential equations including issues pertaining to experimental implementation.

Matthias F. M. Stallmann, Associate Professor of Computer Science (919.515.7978); PhD University of Colorado, 1982; Algorithm design and analysis for both serial and parallel models of computation, combinatorial optimization, graph and matroid algorithms, algorithms for VLSI routing. [stallmann@csc.ncsu.edu]

Leonard Stefanski, Professor of Statistics (919.515.1945); PhD University of North Carolina, Chapel Hill, 1984; Measurement error models, generalized linear models, environmental statistics. [stefansk@stat.ncsu.edu]

William J. Stewart, Professor of Computer Science (919.515.2350); PhD Queen's University, Northern Ireland, 1974; Performance evaluation of computer systems, approximate and numerical solution techniques for the analysis of general queueing networks that can be used to model such systems, numerical linear algebra, computer operating systems and parallel architectures and algorithms. [billy@csc.ncsu.edu]

Moon W. Suh, Professor of Textiles (919.515.6580); PhD North Carolina State University; Probability modeling, quality process design and optimization, applied statistics. [moon_suh@ncsu.edu]

Kristin A. Thoney, Assistant Professor of College of Textiles (919.515.6514); PhD North Carolina State University, 2000; Production scheduling, logistics, supply chain modeling, inventory control. [Kristin_Thoney@ncsu.edu]

Hien T. Tran, Professor of Mathematics (919.515.8782); PhD Rensselaer; Control and inverse problems in infinite dimensional systems. [tran@control.math.ncsu.edu]

Ioannis Viniotis, Associate Professor of Electrical and Computer Engineering (919.515.5148); PhD University of Maryland, 1988; Analysis and control of high speed communication networks, with special emphasis on quality of service control; areas of application include Broadband Integrated Services Digital Networks, sharing of computer resources, routing, flow control and channel access in communication networks. [candice@eos.ncsu.edu]

Mladen A. Vouk, Professor of Computer Science (919.515.7886); PhD King's College, University of London, England, 1976; Software engineering, particularly where it concerns numerical software, software fault-tolerance, software reliability, software testing techniques and tools, software complexity metrics, and the problematics of mixed language programming. [mav@csc.ncsu.edu]

Wenye Wang, Assistant Professor of Electrical Engineering (919.513.2549); PhD Georgia Institute of Technology; Telecommunications and networking including local-area and wide-area networks, wireless networks, network performance, computer communications. [wwang@eos.ncsu.edu]

Donald P. Warsing, Assistant Professor of Operations and Supply Chain Management (919.515.6954); Ph.D. University of North Carolina, 2000; Logistics, production and inventory management, business process analysis and improvement. [don_warsing@ncsu.edu]

James R. Wilson, Professor and Head of Industrial Engineering (919.515.6415); PhD Purdue University, 1979; Design and analysis of simulation experiments, applied probability, and stochastic processes. [jwilson@eos.ncsu.edu]

Fen Wu, Assistant Professor of Mechanical and Aerospace Engineering (919.515.5268); PhD UC Berkeley; Control theory, robust analysis and control, gain-scheduling control design and implementation, model approximation; application of advanced control and optimization techniques to aerospace, mechanical and chemical engineering problems. [fwu@eos.ncsu.edu]

Peter Wurman, Assistant Professor of Computer Science (919.515.9676); PhD University of Michigan, Ann Arbor; Design and evaluation of automated negotiation for electronic commerce, auctions for electronic commerce, combinatorial auctions, trading agents. [wurman@csc.ncsu.edu]

Ting Yu, Assistant Professor of Computer Science (919.513.7578); PhD University of Illinois at Urbana-Champaign; Trust management and privacy preservation in open systems, and database management systems. [yu@csc.ncsu.edu]

CONTACT INFORMATION

For more information about Operations Research at NC State, visit their website:

www.or.ncsu.edu

or contact

Dr. Yahya Fathi (Co-Director, Operations Research),
Dr. Negash Medhin (Co-Director, Operations Research)

or
Barbara Walls (Operations Research Program Assistant)
Operations Research
2152 Burlington Lab
Box 7913, NC State University
Raleigh, NC 27695
email: bwalls@ncsu.edu
phone: (919) 515-2350

Note: Research projects for faculty members in Operations Research are listed under the faculty member's department of main affiliation, listed in other chapters.