

# Andrew G. Loerch

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George Mason University  
Dept. of Systems Engineering  
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Fairfax, VA 22030  
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## EDUCATION

- Cornell University** Ithaca, NY Ph.D. OPERATIONS RESEARCH 1990  
*Dissertation:* "A New Approach to Production Planning, Scheduling, and Due-Date Quotation in Manufacturing Systems." Studied the mathematical structure of the schedule used in a cyclically scheduled manufacturing facility. Exploited this structure in developing a method for the calculation of operation start times, batch sizes, and projected completion time for a given demand. Developed an efficient algorithm based on Dantzig-Wolfe decomposition to solve the problem of finding the least cost combination of additional resources needed to meet the demand by a given due-date. *Advisor:* Professor John A. Muckstadt  
*Minors:* Probability and Statistics, Business Administration (Operations Management)
- Naval Postgraduate School** Monterey, CA M.S. OPERATIONS RESEARCH 1980
- Polytechnic Institute of Brooklyn** Brooklyn, NY B.S. MECHANICAL ENGINEERING 1974

## TEACHING AND OPERATIONS RESEARCH EXPERIENCE

- Associate Professor** *Department of Systems Engineering and Operations Research, George Mason University*  
Fairfax, VA 8/00-present  
Directs Military Operations Research subprogram, and teaches and performs research in operations research methods and applications.
- Division Chief and Senior Operations Research Analyst** *Force Strategy Division, Center for Army Analysis,*  
Fort Belvoir, VA 10/97-8/00  
Supervised a group of 10 operations research analysts performing studies involving Army force structure and Army participation in small scale contingencies and operations other than war. This assignment culminated a 26 year Army career, achieving the rank of Colonel.
- Adjunct Faculty** *Department of Systems Engineering and Operations Research, George Mason University*  
Fairfax, VA 8/99-7/00  
Taught masters level courses in Military Operations Research.
- Senior Operations Research Analyst and Division Chief** *Office of the Deputy Chief of Staff for Operations and Plans, Joint Warfare Studies and Analysis Division, Army Staff* Washington DC 7/96-10/97  
Principle representative of the Army Staff to study teams performing analyses involving multiple military services and joint warfare. Provided advice and recommendations to senior Army leaders regarding these analyses. Supervised office of nine action officers and analysts that performed this function.
- Adjunct Faculty** *The R. B. Pamplin College of Business, Virginia Polytechnic Institute and State University*  
Falls Church, VA 8/93-present  
Teach masters level courses in Operations Management and Decision Support Systems.
- Program Analyst** *Office of the Chief of Staff of the Army, Program Analysis and Evaluation Directorate*  
Washington DC 8/95-7/96  
Performed analysis to support funding decisions for major Army procurement programs.
- Adjunct Faculty** *The George Washington University* Washington DC 1/93-6/93  
Taught masters level course in Discrete Event Simulation in the Department of Operations Research.
- Operations Research Analyst** *U.S. Army Concepts Analysis Agency* Bethesda, MD 8/90-7/95  
Performed studies and basic research to support Department of the Army level decisions regarding all aspects of planning and programming of key Army weapon and support systems, budgeting, and budget execution. Provided

short-notice analytical support concerning critical resource allocation for Operations Desert Shield and Desert Storm. Initiated and coordinated joint programs through the Army Research Office between Concepts Analysis Agency and several universities, including Georgia Institute of Technology, George Mason University, The United States Military Academy, and the University of Minnesota.

**Mathematics Instructor** *Boston University* Zweibruecken, Germany 4/86-6/86  
Taught mathematics review course to graduate students in the Master of Science in Business Administration program.

**Mathematics Instructor** *Embry-Riddle Aeronautical University* Zweibruecken, Germany 1/84-5/84  
Taught undergraduate course in College Algebra and Trigonometry.

**Operations Research Analyst** *U.S. Army Concepts Analysis Agency* Bethesda, MD 10/80-9/83  
Requirements Directorate  
Developed algorithms and performed analyses in support of senior military decision makers. Enhanced large-scale discrete event simulation portraying modern combat systems and operations. Analyzed simulation results and prepared reports. Instructed newly assigned analysts in computer programming and simulation theory.

#### ADDITIONAL EXPERIENCE

**Logistics Officer** *U.S. Army* Zweibruecken, Germany 10/83-7/86  
Managed the maintenance, acquisition, and accountability of over 1200 major items of equipment, and the food service provided to over 2300 workers in a large military organization. Procured over \$10 million of material handling equipment in a two year period.

**Company Commander** *U.S. Army* Fort Ord, CA 3/77-6/78  
Commanded a maintenance facility which provided maintenance support for over 800 major items of equipment, and provided repair part supply support for 1000 lines of inventory.

**Maintenance Manager** *U.S. Army* Fort Ord, CA 6/76-3/77  
Managed the maintenance of all armament equipment in an Army Division. Informed and advised senior commanders and managers concerning the readiness of that equipment.

#### RESEARCH INTERESTS

Optimization of multi-year capital budgeting  
Application of mathematical programming to military problems  
Management of cyclically scheduled manufacturing facilities

#### PUBLICATIONS

with Steven Charbonneau and Karla Hoffman, "Sensor Deployment for Area Coverage and Targeting Under Imprecise Placement," in revision.

with James Passerelli, "U.S. Coast Guard Optimizes Cutter Upgrade Scheduling," Submitted for publication, July 2003.

with Linda Coblenz, "Incorporating Operations Other Than War in Analysis of Force Structure Alternatives for US Ground Forces," Proceedings of the Tenth Nation Symposium on Defense Management (Taiwan), June 2002.

with Carl M. Harris and Edward Rattner, "Racial Equity, The United States Army, Operations Research, and Social Science," Socio-Economic Planning Science, Vol. 34, No. 2, June 2000.

with Carl M. Harris, "An Historical Perspective on U.S. Army Operations Research," Military Operations Research, Vol. 4, No. 4, 1999.

"Incorporation of Learning Curve Costs in Acquisition Strategy Optimization" Naval Research Logistics, Vol. 46, No. 3, April 1999.

with Robert R. Koury and Daniel T. Maxwell, "Value Added Analysis for Army Equipment Modernization," Naval Research Logistics, Vol. 46, No. 3, April 1999.

"Learning Curves," The Encyclopedia of Operations Research and Management Science, Saul Gass and Carl Harris, editors, Kluwer Academic Publishers, 1996.

with Natasha Boland, Ellis L. Johnson, and George L. Nemhauser. "Finding an Optimal Stationing Policy for the US Army in Europe After the Force Drawdown." Military Operations Research, 1996, Vol. 2, No. 4.

with John A. Muckstadt. "An Approach to Production Planning and Scheduling in Cyclically Scheduled Manufacturing Systems." International Journal of Production Research, 1994, Vol. 32, No. 4.

with William F. Mann, "Response Surface Methodology for Value Added Analysis." Proceedings of the Thirty Seventh Conference on the Design of Experiments in Army Research, Development and Testing. May 1992

with James H. Pillsbury. "Improving Ammunition Supply in Europe." Army Logistician, Professional Bulletin of United States Army Logistics. PB 700-87-1, March-April 1987.

### **SELECTED PRESENTATIONS**

"U.S. Coast Guard Optimizes Cutter Upgrade Scheduling," INFORMS Computing Society Symposium, January 2005.

"Designing a P-Survivable Wireless Network,"(with Steven Charbonneau and Karla Hoffman) 72<sup>nd</sup> MORS Symposium, June 2004.

"Sensor Deployment for Area Coverage and Targeting under Imprecise Placement,"(with Steven Charbonneau and Karla Hoffman) 72<sup>nd</sup> MORS Symposium, June 2004.

"Incorporating Operations Other Than War in Analysis of Force Structure Alternatives for US Ground Forces," Tenth Nation Symposium on Defense Management (Taiwan), June 2002.

"A Framework for Optimizing Force Structure Resourcing." INFORMS National Meeting, October 1998.

"Incorporating Learning Curve Costs In Acquisition Strategy Optimization." INFORMS National Meeting, April 1995.

"Optimization of Deployment Enhancement Projects for the US Army." ORSA/TIMS Joint National Meeting, October 1994.

"Incorporating Learning Curve Costs In Acquisition Strategy Optimization." 15th International Symposium on Mathematical Programming, August 1994.

"Finding an Optimal Stationing Policy for the US Army in Europe After the Force Drawdown," ORSA/TIMS Joint National Meeting, April 1994.

"Value Added Analysis for Army Equipment Modernization," Quadrapartite Working Group on Army Operations Research, January 1994.

"Value Added Analysis for Army Equipment Modernization," 61st Military Operations Research Society Symposium, June 1993.

"Finding an Optimal Stationing Policy for the US Army in Europe After the Force Drawdown," 61st Military Operations Research Society Symposium, June 1993.

"Renewables and Energy Efficiency Planning," 61st Military Operations Research Society Symposium, June 1993.

"Value Added Analysis for Army Equipment Modernization," ORSA/TIMS Joint National Meeting, May 1993.

"Value Added Analysis for Army Equipment Modernization," Invited lecture, Systems Engineering Seminar, United States Military Academy, February 1993.

"Value Added Analysis for Army Equipment Modernization," Operations Research Symposium, The George Washington University, January 1993.

"An Approximate Algorithm for Incorporating Learning Curve Costs In Acquisition Strategy Optimization," 60th Military Operations Research Society Symposium, June 1992.

"A New Approach to Production Planning, Scheduling, and Due-Date Quotation in Manufacturing Systems," ORSA/TIMS Joint National Meeting, October 1989.

"Using Cyclic Scheduling in Manufacturing Systems," Presented at the Summer Operations Management Conference, Massachusetts Institute of Technology, June 1989.

#### **PROFESSIONAL ASSOCIATIONS**

Institute for Operations Research and the Management Sciences (INFORMS)  
Immediate Past President, Military Operations Research Society (MORS)  
Associate Editor *Operations Research* and *Military Operations Research*  
Production and Operations Management Society  
Mathematical Programming Society

#### **HONORS**

Dr. Wilbur B. Payne Memorial Award for Excellence in Analysis (Group Award)  
President, Military Operations Research Society  
Four times nominated for the Barchi Prize for outstanding paper presented at the MORS Symposium  
Twice selected for the U.S. Army Fully Funded Graduate School Program  
Distinguished Visiting Scholar, LMI Research Institute