

Mark W. Lewis, Ph.D.

Associate Professor

Management Information Systems / Production Operations Management / Management Science

Missouri Western State University

St. Joseph, MO 64507

Phone: 816-271-4273

Email: mlewis14@missouriwestern.edu

Education:

SOUTHERN METHODIST UNIVERSITY, Dallas, Texas

Ph.D. in Operations Research, May 2000

Dissertation Topic: *Spare Capacity Planning in Telecommunications Networks: Models and Algorithms.*

Dissertation Advisor: Professor Jeffery L. Kennington

Minors: Engineering Management, Computer Science

SOUTHERN METHODIST UNIVERSITY, Dallas, Texas

Master of Science Operations Research, September 1995

UNIVERSITY OF KANSAS, Lawrence, Kansas

Bachelor of Science Electrical Engineering, May 1984

Research Interests:

My research is in the areas of optimization algorithms and their applications to robust network design. I employ mathematical modeling techniques as well as simulation, data mining and visualization to incorporate into decision support systems. My research involves both exact and heuristic algorithms with appropriate data structure exploitation. I have developed and published a unique mixed-integer program pre-processor, Guided Design Search (GDS), based on Taguchi methods and experimental design sampling techniques that has been successfully integrated with both branch-and-cut and metaheuristic search algorithms. The insights into problem structure provided by GDS are providing a pipeline of research opportunities.

Work Experience:

Associate Professor, Missouri Western State University 2005 – present.

Assistant Professor, Management Information Systems / Production Operations Management, University of Mississippi 2001 – 2005.

- Hearin Center for Enterprise Science faculty member (see hces.bus.olemiss.edu).
- Co-principal investigator for Office of Naval Research simulation-optimization STTR grant with OptTek systems for Optimal Manpower and Personnel planning system.

Research Analyst, TelOptica, Inc. 2000 - 2001

Team member of start-up company providing Java-based decision support systems and professional services to the telecommunications industry. Primary task: leading development and integration of network flow algorithms (both stochastic and deterministic) for the DSS.

Adjunct Instructor, Computer Science & Engineering Department, Southern Methodist Univ.
CSE 1341: Introduction to C Programming 1998 - 1999
CSE 1305: Introduction to Computers and Information Technology 1998.

Project Engineer, Lockheed Martin Tactical Aircraft Systems, Fort Worth, TX 1984 - 1996
Engineering management experience at all levels of the system development life cycle for various F-16 aircraft avionics. Obtained development and production funding for an aft crew station Heads-Up-Display used for situational awareness during training and navigation and weapons delivery; obtained funding for the redesign of various Radar/Electro-Optical display processor circuit cards with parts obsolescence problems.

Worked on numerous proposals with cross-functional teams for developing flat-panel color crew station displays with integrated processing capability for the F-16 and derivatives in order to enhance pilot-vehicle interface and aircraft mission effectiveness. Instrumental in updating/refining the subcontractor selection process for product development in the areas of writing technical requirements, request-for-proposal packages, supplier workshops, proposal evaluation and subcontractor project management.

Intermediate Level Integrated Avionics Technician, United States Air Force 1976 - 1981
Maintained semi-automatic test equipment, tested and repaired F-15 avionics in intermediate level repair shops at Langley and Kadena Air Bases. Received monetary award for improvement to dual-axis symbol measurement for test equipment with vernier scales.

Refereed Journal Publications:

J. Kennington and M. Lewis, "The Path Restoration Version of the Spare Capacity Allocation Problem with Modularity Restrictions: Models, Algorithms, and an Empirical Analysis", *INFORMS Journal On Computing*, Volume: 13 (3). Summer 2001, 0181-0190.

M. Lewis, "The Effects of Network Characteristics on Joint Capacity Optimization in Robust Telecommunications Networks," *International Journal Of Operations and Quantitative Management*, Vol. 10, No 3, Sep 2004, 1-19.

M. Lewis, G. Kochenberger, and B. Alidaee, "Using xQx to model and solve the uncapacitated task allocation problem", *OR Letters*, Volume: 33, 2005, 176-182.

M. Lewis, K. Lewis, B.J. White, "Guided Design Search in the Interval Bounded Sailor Assignment Problem", *Computers and Operations Research (avail. on-line Dec. 2004)*.

Lewis, M.W., 2004. "Guided Design Search as a Decision Support Tool in Network Design", *Academy of Information and Management Science*, Vol. 8 (2005).

Journal Publications (in work):

- G. Kochenberger, B. Alidaee, K. Lewis, M. Lewis, "Modeling and Solving Set Packing Problems Via Unconstrained Quadratic Programming", in revise and resubmit to *European Journal of OR*.
- M. Lewis, "A Preprocessing Technique for the Fixed Charge Capacitated Multicommodity Network Design Problem," in revise and resubmit to *Networks*
- M. Lewis, G. Kochenberger, F. Glover, and B. Alidaee, "xQx as a Modeling and Solution Framework for the Linear Ordering Problem" submitted to *4OR*.
- M. Lewis, G. Kochenberger, and F. Glover, "Dense Set Partitioning Instances Solved within an xQx Framework" submitted to *Computational Optimization and Applications*.
- M. Lewis, "Robust Network Design Using Disjoint Paths Sets"
- M. Lewis and G. Kochenberger, "Path Re-linking in the Solution of Unconstrained Quadratic Programs"
- M. Lewis and B.J. White, "An Application of the Linear Ordering Problem to Web Site Use and Design"
- M. Lewis, B. Alidaee, H. Wang "An Application of the Linear Ordering Problem to Gene Sequencing"

Conference Proceedings and Presentations:

- M. Lewis (2004), "Guided Design Search for the Sailor Assignment Problem". INFORMS National Meeting, Denver, CO. October 2004.
- M. Lewis (2004), "Using Guided Design Search in Capacitated Network Design". INFORMS Telecommunications National Meeting, Boca Raton, FL. March 2004.
- M. Lewis (2003), "Guided Design Search in the Sailor Assignment Problem: Grant Results". Military Operations Research Society / DC INFORMS Chapter, Washington, DC. March 2003.
- M. Lewis (2001), "Joint Working and Spare Capacity Allocation in a Multi-Commodity Flow Network". INFORMS National Meeting, Miami, FL. November 2001.
- M. Lewis (1999), "Spare Capacity Allocation in Mesh Telecommunications Networks". INFORMS National Meeting, Philadelphia, PA. November 1999.

Teaching Evaluations:

Generally excellent or superior and are available online at <http://www.olemiss.edu/teacheval/> (click public access, then search by instructor last name)

Awards:

- *Doctoral Colloquium*, Seattle INFORMS, 1998
- *Outstanding Graduate Student*, Computer Science and Engineering Department, SMU 1999
- *Faculty Research Fellow*, Office of Sponsored Research Programs, UM, 2003

Professional Service:

- University of Mississippi Business School Faculty Senator
- *Reviewer*, “Experiments with and on Algorithms for Maximum Likelihood Clustering”, Computational Statistics & Data Analysis
- *Reviewer*, Principles of Working Information System Management, Prentice-Hall.
- *Reviewer*, Management Information Systems For Business-Driven Enterprises, McGraw-Hill

Grants:

“Guided Design Search,” sponsored by the U. S. Office of Naval Research, grant number N00014-03-1-0621, 2003-2004, \$103,690.

Comprehensive Optimal Manpower and Personnel Analytic Support System (COMPASS) STTR with OptTek, sponsored by the U. S. Office of Naval Research and Navy Personnel Research, Studies and Technology Department.

Teaching Experience:

Management Information Systems II
Applications of MIS Capstone Course
Introduction to C Programming
Introduction to Computers and Information Technology