

CURRICULUM VITAE

WEI-SHEN HSIA

AFFILIATION: Department of Mathematics
The University of Alabama
Box 870350
Tuscaloosa, AL 35487-0350

TITLE: Professor

EDUCATION: B.A., National Tsing-Hua University,
Mathematics, 1968.

Ph.D., Rice University, Operations Research,
1973.

ADMINISTRATION POSITION (1990 - 1999):
Chairman, Department of Mathematics
University of Alabama

RESEARCH INTEREST: Mathematical Programming, Stochastic
Programming, Probability and
Statistics, Convex Analysis, and
Sensitivity Analysis, K-12 Education

K-12 EDUCATION RELATED COMMITTEE OR PANEL:
Validation/standard setting panel for
assessments to be used by Alabama to
show "highly qualified" status in order
to meet the regulations prescribed in
the "No Child Left Behind" legislation.
Spring 2004.

WORKSHOP ATTENDED:

1. SUM Workshop - Fathom Basic and Intermediate by Key Curriculum Press, Atlanta, Ga, February 28, 2004.
2. Preparing Mathematicians to Educate Teachers Meeting: Orlando, FL, February 21 - 22, 2004.
3. Preparing Mathematicians to Educate Teachers Meeting: Atlanta, GA. November 15 - 16, 2003.

4. Preparing Mathematicians to Educate Teachers (PMET) workshop - elementary level, Appalachian State University, Boone, NC, August 3 -10, 2003

EDUCATION GRANT:

1. January 2005 : Preparing Prospective Elementary School Teachers in Mathematics in Alabama: Dissemination to Community Colleges (co-PI: Dr. Cecelia Laurie and Dr. Cristina Gomez), \$4,000, supported by MAAA and PMET.
2. January 2004 - December 2004: Developing Mathematics Courses for Prospective Elementary Teachers (Co-PI: Dr. Cecelia Laurie), \$4,000, supported by MAA and PMET.
3. November 2003 - October 2004: Data Analysis and Statistics for Practicing Teachers: Understanding Student's Statistical Ideas (Co-PI: Dr. Cristina Gomes and Dr. Cecelia Laurie), \$54,768, supported by the Alabama Department of Education.
4. June 2002 - May 2003: Re-design Math 208 and design a new course Math 209 (Co-PI: Dr. Cecelia Laurie), \$2,000, College of A&S Teaching Grant.
5. May 1997 - April 1999: Algebra Pilot Project, \$41,500, supported by the Gabriella and Paul Rosenbaum Foundation.

OTHER GRANTS:

1. May 1988-July 1989: Research grant awarded from NASA (NAG8-081, supplement 4) working on "Computer Aided Design Software for the Optimal Projection/Maximum Entropy Design Methods for Large Space Structures".
2. May 1988-Dec. 1988: Study grant awarded from the Office of Academic Affairs, University of Alabama. Development of an Enrollment

Management Model for the University of
Alabama" (co-PI: Dr. Robert Batson).

3. Oct. 1986 - June 1987: Research grant awarded from NASA (NAG8-081) working on "Computer Aided Design Software for the Optimal Projection/Maximum Entropy Design Methods for Large Space Structures".
4. Summer, 1986: Awarded NASA/ASEE Faculty Research Fellowship.
5. Summer, 1985: Awarded NASA/ASEE Faculty Research Fellowship.
6. 1980-1981: Visiting research professor sponsored by the National Research Council, Republic of China, contract number NSC 70-0204-M005-01. "sensitivity analysis of mathematical programming".
7. Summer, 1978: Worked on "Problems on Monotone Processes and Polyhedral Convex Processes" which was supported by the University of Alabama under the project number 951.
8. Summer, 1977: Worked on "Estimating the Bounds for Error in the Solution Set of a Perturbed Mathematical Program" which was supported by The Graduate School of the University of Alabama.
9. Summer, 1976: Worked on "The Sensitivity Analysis of Stochastic Programs" which was supported by a research grant sponsored by the University of Alabama under the contract 1-6-21-1145-04. The report "The Probability Density Function of a Stochastic Linear Programming Problem" has been published in Naval Research Logistic Quarterly, vol. 24, No. 3, 1977.
10. Summer, 1975: Worked on "A Method for Quadratic Programs" which was supported by a research grant sponsored by the University of Alabama under the contract 1-6-21-1145-02. The report "A Method

for Quadratic Programs" has been published in OPSEARCH, Vol. 14, No. 2, 1977.

11. January, 1973: May, 1973: Worked on "Remote-Sensing Control" which was supported by NASA under the contract NAS 9-12776. Published a technical report "Optimal Feature Extraction - The Two Class Cases" (co-author: R.J.P. de Figueiredo).

12. Summer, 1972: Worked on "Decomposition Method on Large-Scale Programming Problems" which was supported by Army Research office under the contract DA-ARO-D-31-124-72-G30. The result of the research is part of my Ph.D. dissertation.

PUBLICATIONS

1. On Rutenberg's Decomposition Method, Management Science, vol. 21, No. 1, 1974, pp. 10-12.
2. A Convergence Theorem, OPSEARCH, vol. 12, 1975, pp. 24-29.
3. Decomposition of the convex simplex method, Journal of Optimization Theory and Applications, vol. 66, 1975, pp. 399-407.
4. The joint probability density function of the occupation time of a three state problem, J. of Applied Prob., vol. 13, 1976, pp 57-64.
5. Bounds for the solution of a stochastic program with recourse, Bulletin of the Institute of Mathematics, Academia Sinica, vol. 4, no. 2, 1976, pp. 307-311.
6. A method for quadratic programs, OPSEARCH, vol. 14, no. 2, 1977, pp. 118-124.
7. On stochastic program with simple recourse, JMAA, vol. 58, no. 3, May 1977, pp. 705-712.

8. The probability density function of a stochastic linear programming problem, *Naval Research Logistic Quarterly*, vol. 24, no. 3, Sept. 1977, pp. 417-424.
9. On a quadratic stochastic program with simple recourse, *Bulletin of the Institute of Mathematics Academia Sinica*, vol. 7, no. 1, 1979, pp. 87-97
10. A note on the multiplication of two 3x3 fibonacci-rowed matrix (co-author A.J.G. Babu), *The Fibonacci Quarterly*, vol. 18, no. 1, 1980, p. 43.
11. On the existence of unique eigensets of monotone processes, (co-author, B.R. Natarajan), *Rocky Mountain Journal of Mathematics*, Spring 1982, vol. 12, (2), 213-218.
12. Queuing where arrival rate depends upon degree of service available (co-author Meckinley Scott), *Bulletin of the Institute of Mathematics Academic Sinica*, March, vol. 10, (1)1982, 9-23.
13. A finite queue with some control on service and arrival rates (co-author Meckinley Scott), *Centre D'etudes De Recherche Operationnelle*, vol. 25, nos. 1-2, 1983, 129-141.
14. Bed boundaries observed in the Borehole (co-author, J. H. Fang). *The Geology Society of America*, to appear in vol. 16, No. 6, Sept. 1983, pp. 11-21.
15. Stability in a convex program with linear constraints, *J. Korean Math. Soc.*, Vol. 21(1984) No. 2, 71-80.
16. On multiple objective programming problems with set functions (coauthor: J. H. Chou, T. Y. Lee) *JMAA*, vol. 105, No. 2 (1985) pp. 383-394.
17. Second Order optimality conditions for mathematical programming with set functions (coauthor: J. H. Chou, T. Y. Lee), accepted by *J. of the Australian Mathematical Society*, Ser. B, vol. 26 (1985) pp. 284-292.
18. Epigraphs of Convex set functions (co-author: J. H. Chou, T. Y. Lee), *JMAA*, vol. 118, No. 1, Aug. 15, 1986, pp. 247-254.

19. Convex programming with set functions, (co-authors: J.H.Chou, T.Y. Lee), Rocky Mountain Journal of Mathematics, vol. 17, No. 3, 1987, pp. 535-543.
20. Proper D-solutions of Multi-objective programming with set functions (co-author: T.Y. Lee), JOTA, vol. 53, No. 2, May 1987.
21. Lagrangian Function and Duality Theory in Multiobjective Programming with Set Functions, (co-author: T. Y. Lee), JOTA, vol. 57, No. 2, May 1988, pp. 239-251.
22. Lines regression and some relations between slopes and intercepts considered from a geometric viewpoint, (co-author: D. Runcie, J. Neggers), British Journal of Mathematical and Statistical Psychology, vol. 44, 1991, pp. 1-11.
23. Lagrange Multiplier Theorem of Multiobjective Programming Problems with Set Functions, (co-author: T.Y. Lee, J.Y. Lee) JOTA Vol. 70, No. 1, July 1991 pp. 137-155.
24. Convolution of Set Functions, (co-author: T.Y. Lee, J.H. Lee), Rocky Mountain Journal of Mathematics, vol. 21, No. 4, 1991, pp. 1317-1325.
25. Some Minimax Theorem On Set Functions (co-author: T.Y. Lee) to Bulletin of the Institute of Mathematics Academia Sinica, vol. 25, No. 1, March 1997.
26. The Archaeological Dig Site: Using Geometry to Reconstruct the Past" (co-author: Patricia Moyer), Mathematics Teacher (2001).

CONFERENCE PROCEEDINGS:

1. A more efficient algorithm for an optimal tour of a health care consumer with multiple health care facilities in each county, (co-author: A.J. G. Babu), Proceedings of Nonlinear System and Applications (ed. V. Lakshmikantham) Academic Press, 1977, pp. 373-380.

Ph.D. DISSERTATION DIRECTED:

1. Wasantha Daundasekera: "Optimization Theory For n-Set Functions", 1995.
2. Gyeong-Mi Cho: "Stability Analysis In Stochastic Multiple Objective Programming Problems", 1991
3. Jae Hak Lee: "Convex Analysis of Set Functions", 1987.
4. Jun Yull Lee: "Lagrange Multipliers and Duality Theorems of Multiobjective Optimization with Set Functions", 1987.
5. Bin Chen: "Stochastic Multiobjection Programming", 1980.
6. Balakrish R. Natarajan: "Eigensets of Monotone Processes", 1980.
7. Robert B. Batson: "Stability Theory for Mathematical Programming Problems with Unbounded Convex Feasible Regions: A Point-To-Set Submap Approach", 1979.

OTHER PUBLICATIONS:

1. Optimal Feature Extraction - The Two Class Cases, Technical Report NAS-9-12776. Rice University, May 1973 (co-author: F.J.F. de Figueiredo).
2. Report on a study of the Paperboard Converting Entity's Forecasting Models, Aug. 1983. A consultant contract supported by the Gulf State Paper Corp. Tuscaloosa, Alabama.

3. A method for pseudo-linearizing nonlinear systems with six state variables and three control variables, Research Report 1985 NASA/ASEE Summer Faculty Fellowship Program.
3. Stochastic modeling and control system designs of the NASA/MSFC ground facility for LSS - the ME/OP approach. Research report 1986 NASA/ASEE Summer Faculty Fellowship Program.

PRESENTATIONS:

1. "Engaging Math Faculty in Teacher Preparation", (Co-Authors: Cecelia Laurie and Cristina Gomez); AMS and MAA Joint National Conference; San Antonio, January 12 - 15, 2006.
2. "Content Course for Pre-service Teachers, (Co-Authors: Cecelia Laurie and Cristina Gomez); AMS and MAA Joint National Conference; San Antonio, January 12 - 15, 2006.
3. "The Problems of Posing Problems with Fractions", (Co-Authors: Cecelia Laurie and Cristina Gomez); AMS and MAA Joint National Conference; Atlanta, January 5-8, 2005.
4. "Data Analysis and Statistics for Practicing Teachers: Understanding Student's Statistical Ideas"; (Co-Authors: Cecelia Laurie and Cristina Gomez); AMS and MAA Joint National Conference; Atlanta, January 5-8, 2005.
5. "Teaching Visualization Skills in a Geometry Course for Pre-service Elementary School Teachers"; (Co-Authors: Cecelia Laurie and Cristina Gomez); AMS and MAA Joint National Conference; Atlanta, January 5-8, 2005.
7. "Preparing Prospective Elementary School Teachers in Mathematics"; (Co-Authors: Cecelia Laurie and Cristina Gomez); AACTM 55th Annual Conference; Dothan, Alabama, Feb. 12, 2005.

WORKSHOP ORGANIZED:

1. "Mathematics courses for pre-service elementary school teachers"; March 6, 2004. (Co-organizers: Cecelia Laurie and Cristina Gomes).

2. "Using Technology in courses for Pre-Service Elementary School Teachers"; October 9, 2004. (Co-organizers: Cecelia Laurie and Cristina Gomes).

OTHER SERVICES:

Graduate Advisory Committee, Chairman (1983)
 Applied Statistics Program
 Affirmative Action Committee

TEACHING EVALUATION RECORDS:

| <u>SEMESTER</u> | <u>COURSE</u> | <u>RATING</u> |
|-----------------|---------------|---------------|
| Fall 1982 | MA 121 | 4.0 |
| | MA 121 | 4.4 |
| | MA 411 | 4.1 |
| SPRING 1983 | MA 112 | 4.0 |
| | MA 412 | 4.5 |
| SPRING 1984 | MA 126 | 3.9 |
| | MA 126 | 3.7 |
| | MA 357 | 4.3 |
| FALL 1984 | MA 125 | 4.3 |
| | MA 125 | 4.3 |
| | MA 520 | 5.0 |
| SPRING 1985 | MA 126 | 3.9 |
| | MA 126 | 3.8 |
| | MA 521 | 5.0 |
| FALL 1985 | MA 227 | 3.9 |
| | MA 485 | 4.4 |
| | MA 692 | 5.0 |
| SPRING 1986 | MA 227 | 4.8 |
| FALL 1986 | MA 126 | 4.2 |
| | MA 692 | 5.0 |
| SPRING 1987 | MA 121 | 4.2 |
| | MA 121 | 4.2 |
| FALL 1987 | On sabbatical | |

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|-------------|------------|-----------|
| SPRING 1988 | MA 456/512 | 4.9 |
| | MA 555-001 | 4.7 |
| FALL 1988 | MA 126-001 | 4.7 |
| | MA 485-001 | 4.3 |
| SPRING 1989 | MA 486/521 | 4.9 |
| FALL 1989 | MA 520-001 | 4.6 |
| SPRING 1990 | MA 540-001 | No Report |
| FALL 1990 | MA 126-004 | 4.8 |
| SPRING 1991 | MA 540-001 | 5.0 |
| FALL 1991 | MA 355-001 | 4.1 |
| SPRING 1992 | MA 125-006 | 4.7 |
| FALL 1992 | MA 520-001 | 4.7 |
| SPRING 1993 | MA 523-001 | 4.8 |
| FALL 1993 | MA 227-003 | 4.8 |
| SPRING 1994 | | |
| FALL 1994 | MA 227-003 | 4.5 |
| | MA 227-012 | 4.4 |
| SPRING 1995 | | |
| FALL 1995 | MA 121-013 | 4.3 |
| SPRING 1996 | MA 504-001 | 5.0 |
| FALL 1996 | MA 121-014 | 4.5 |
| SPRING 1997 | MA 504-001 | 5.0 |
| FALL 1997 | MA 227-003 | 4.7 |
| SPRING 1998 | MA 504-001 | 5.0 |
| FALL 1998 | MA 303-001 | 4.8 |

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| SPRING 2000 | MA 504-001 | 5.0 |
| FALL 2000 | MA 227-006 | 4.4 |
| | MA 208-001 | 3.9 |
| SPRING 2001 | MA 504-001 | 5.0 |
| | MA 121-025 | 3.9 |
| FALL 2001 | CEE 580 | 4.5 |
| | MA 303-001 | 5.0 |
| SPRING 2002 | MA 121-029 | 4.7 |
| | MA 121-029 | 4.4 |
| | MA 504-001 | 4.9 |
| FALL 2002 | MA 208-001 | 4.1 |
| | MA 125-015 | 4.5 |
| | MA 131-004 | 4.6 |
| SPRING 2003 | MA 504-001 | 5.0 |
| | MA 131-081 | 4.8 |
| | MA 131-082 | 4.9 |
| FALL 2003 | MA 110-013 | 2.2 |
| | MA 208-001 | 4.0 |
| | MA 125-007 | 4.6 |
| | MA 125-011 | 4.7 |
| SPRING 2004 | MA 125-081 | 4.8 |
| | MA 208-001 | 4.0 |
| | MA 504-001 | 5.0 |
| FALL 2004 | MA 121-001 | 4.8 |
| | MA 121-004 | 4.5 |
| | MA 121-007 | 4.8 |
| | MA 209-002 | 3.9 |
| SPRING 2005 | MA 121-001 | 4.6 |
| | MA 121-003 | 4.4 |
| | MA 121-007 | 4.4 |
| FALL 2005 | MA 121-001 | 4.6 |
| | MA 121-004 | 4.6 |
| | MA 121-006 | 4.4 |
| | MA 209-001 | 4.6 |
| FALL 2006 | MATH113-010 | 4.4 |
| | MATH113-012 | 4.2 |

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|-------------|-------------|-----|
| | MATH113-008 | 4.6 |
| | MATH210-001 | 4.9 |
| SPRING 2007 | MATH113-010 | 4.5 |
| | MATH113-012 | 4.8 |
| | MATH113-016 | 4.5 |
| | MATH210-001 | 5.0 |
| FALL 2007 | MATH125-010 | 4.6 |
| | MATH125-014 | 4.7 |
| | MATH209-001 | 4.6 |
| | MATH209-002 | 4.5 |
| SPRING 2008 | MATH125-009 | 4.8 |
| | MATH209-001 | 4.4 |
| | MATH209-002 | 4.8 |
| FALL 2008 | MATH125-010 | 4.8 |
| | MATH209-001 | 5.0 |
| | MATH209-002 | 4.9 |
| | MATH125-014 | 5.0 |
| SPRING 2009 | MATH125-008 | 4.9 |
| | MATH125-009 | 4.7 |
| | MATH355-001 | 4.1 |
| FALL 2009 | MATH125-012 | 4.8 |
| | MATH125-014 | 4.9 |
| | MATH355-001 | 4.1 |