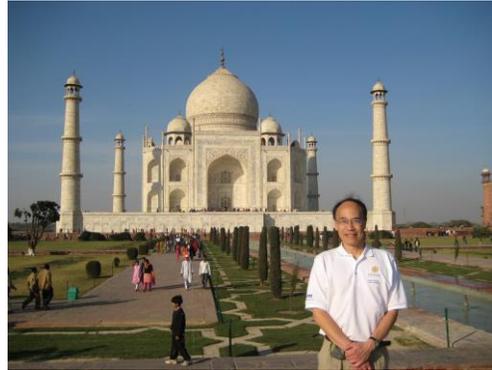


## DR. H.-S. JACOB TSAO

**Professor and Director of MS in Industrial  
and Systems Engineering (MS-ISE) Program  
Department of Industrial & Systems  
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### EDUCATION

- Ph.D.** University of California, Berkeley  
Ph.D. in Operations Research, December 1984.  
Minor fields: Probability Theory, Econometrics.
- M.S.** University of Texas at Dallas  
M.S. in Mathematical Statistics, December 1979.
- B.S.** National Chiao-Tung University, Taiwan  
B.S. in Applied Mathematics, June 1976.

### RESEARCH INTERESTS

Design of Experiment  
Statistical Quality Control and Reliability  
Operations Research  
Intelligent Transportation Systems and Services  
Efficiency of Large-Vehicle Operations and Services (Trucks and Buses)  
Innovation Education and Research

### COURSES TAUGHT

Quality Assurance and Reliability (Graduate and Undergraduate)  
Design and Analysis of Statistical Experiment (Graduate and Undergrad.)  
Advanced Operations Research (Graduate IE and MBA)  
Management Science (Two-year MBA & One-year MBA; Mumbai, India)  
Systems Engineering (Graduate and Undergraduate)  
Information Engineering (Graduate)  
Introduction to Operations Research (Undergraduate)  
Engineering Probability and Statistics (Undergraduate)  
Statistical Process Control (Undergraduate)  
Engineering Statistics and Analysis (Undergrad Non-IE majors, Hands-on)  
AI Tools & Practice for Systems Engineering (Grad.; developed for 2021)

## AWARDS AND HONORS

- 2017      **The Newnan Brothers Award for Faculty Excellence** (Highest among 4 College of Engineering Faculty Awards; awarded the 3 others earlier)  
**Davidson College of Engineering**, San Jose State University
- 2016      **Davidson College of Engineering Faculty Award for Excellence in Scholarship**  
**Davidson College of Engineering**, San Jose State University
- 2011-2012      **Teacher-Scholar**  
San Jose State University  
The representative from **College of Engineering**  
(One representative from each college per year)
- 2011      **The Applied Materials Award for Excellence in Teaching**  
**Davidson College of Engineering**, San Jose State University
- 2010      **Donald Newnan Teaching Excellence Award**  
Department of Industrial and Systems Engineering, San Jose State University
- 2005      **The McCoy Family Faculty Award for Excellence in Service**  
**College of Engineering**, San Jose State University

## JOURNAL EDITORSHIP

- 2010-2015      Area Editor of Statistics, Quality, Reliability and Maintenance for *Computers and Industrial Engineering*, a journal (published by Elsevier) with a 2018 impact factor of 3.518 and a 5-year impact factor of 3.600.

## SCHOLARSHIP PROGRAM

- National Science Foundation, “Silicon Valley Innovation and Entrepreneurship Scholarships (SVIES) Program” (Award Number 1458794): total budget of \$599,642 for 120 semester scholarships of \$5K or \$4K at the College of Engineering of San Jose State University; PI (with Dr. Ahmed Hambaba, Professor of Computer Engineering, as the co-PI); Feb 15, 2015 – Jan. 31, 2020.

## LECTURE FOR NON-ACADEMIC OR GENERAL PUBLIC

- “Silicon Valley Innovations and Entrepreneurs – From the Vacuum Tube to YouTube and Beyond.” (The key innovation of the vacuum-tube technology was invented in 1912 by a Yale-University-trained prolific inventor Dr. Lee Deforest at a lab in the city of Palo Alto, which is near Stanford University and a major city in the Silicon Valley. The duration of the lecture can be two hours, shorter or much longer.)

## **WORK EXPERIENCE**

1/2018-Present **College of Engineering**

**San Jose State University, San Jose, California**

***Associate Dean for Extended Studies (40%-time Appointment)***

Managing all corporate and off-campus graduate programs offered by the College. Initiated development of a new program MS in Artificial Intelligence for a Fall 2020 launch at a Silicon Valley company; the proposed program has been approved by the university and submitted to the Chancellor's Office of California State University (CSU) System for final approval. Developing a new program MS in Alternative Energy and Smart Grid and exploring others to meet the dynamic education needs of the Silicon Valley.

8/1999-Present **Department of Industrial and Systems Engineering**

**San Jose State University, San Jose, California**

***Full Professor; Director of the MS in Industrial and Systems Engineering (MS-ISE) Program (Associate Prof. till 2005)***

Teaching graduate and undergraduate courses in the area of operations research, statistics, quality assurance, reliability, design and analysis of statistical experiment, information engineering, etc. Supervising student research at the graduate level. Developed a graduate course Artificial Intelligence Tools and Practice for Systems Engineering to be launched in Spring 2021.

Conducting research into fair and competitive political districting with binary linear programming, design of efficient statistical experiments (minimization of number of test runs, optimal sequencing of tests, etc.); design of freight-transportation vehicles and systems; design of efficient public-transportation systems (e.g., bus rapid transit or BRT systems); efficiency optimization for service systems (e.g., airport operations), development and evaluation of intelligent transportation systems (ITS) operational concepts; development of operations-research techniques (e.g., mixed-integer programming, linear programming, entropy optimization, etc.); process reengineering for improved software quality and reliability; etc.

Consulting and conducting training for medical-device firms of the Silicon Valley.

2009 - Present **SP Jain Institute of Management and Research**

**Mumbai, India**

***Adjunct Professor of Management Science/Operations Research***

Since Fall 2009, taught Management Science (a second course on Operations Research) for a two-year MBA program and a one-year intensive MBA program.

Conducted research on the grain supply chains of India, among others, and proposed drastically more efficient operations enabled by mathematical optimization of supply chains, advanced information technology and branding, as part of quality assurance. Conducted research on drastically increasing the productivity of India's trucking industry by safely introducing operations of double-trailers in the current roadway system of India through the enabling technology of automated trailer steering (designed to make tracks of trailer wheels follow those of the tractor wheels). Also developing other new operational concepts of buses and trucks for India.

3/92-8/1999 **Institute of Transportation Studies, University of California, Berkeley**  
*Assistant, Associate and Full Research Engineer*

Conducted research into mathematical programming, including linear and quadratic programming and entropy optimization, and applied combinatorial optimization. Applying operations research techniques to solving diverse problems in transportation research.

Worked in the National Center of Excellence for Aviation Operations Research (NEXTOR), which is a four-university research program led by the Institute of Transportation Studies at UC Berkeley. Modeled air freight operations at Bay Area airports and identified efficiency-improvement opportunities. Researched into logistics, e.g., optimal routing for air freight forwarding subject to time and reliability constraints. Conducted statistical analysis for delays of flight operations, with multivariate techniques like cluster analysis, factor analysis, multiple regression, analysis of variance, nonparametric statistics, etc..

Was active in National Automated Highway Systems Consortium (NAHSC), which was a \$50-million seven-year nine-organization R&D consortium formed in Nov. 1994. Led many Consortium projects, including system capacity modeling, estimation and optimization, etc. Also conducted research into mathematical optimization in urban transportation planning, e.g., trip distribution, dynamic traffic assignment.

6/88-2/1992 **AT&T Bell Laboratories, Holmdel, New Jersey.**  
*Member of Technical Staff (Network Transport & Realization Planning)*

Led the ASP (Automated Service Provisioning System - a large-scale computer and decision-support system that automates the circuit provisioning process and minimizes the network cost for all AT&T private network services) Algorithm/Performance Team of four professionals in OR modeling and development of mathematical algorithms. Major network optimization problems formulated and solved include real-time optimal circuit layout for a single special-service circuit and collective circuit selection for a large volume of circuits. Modeled the network capacity expansion and allocation problems for the AT&T domestic backbone long-distance network with various route-diversity and

reliability constraints (to limit the impact of link or node failures) as large-scale nonlinear programs that seek to minimize the network cost for meeting future demand; developed mathematical algorithms and software prototypes on a vector/parallel computer (Alliant FX80).

7/86-6/1988 **Bell Communications Research, Morristown, New Jersey.**  
*Member of Technical Staff (Local Network Planning Department)*

Worked in the systems engineering group for Loop Engineering Information System (LEIS) - a large-scale information and decision-support system designed to automate and optimize the engineering and management processes of local telephone networks. Developed mathematical algorithms that produce capacity expansion plans (including mix of technologies, timing and sizing, etc) for local (loop) telephone networks. Developed stochastic models for the operating cost of various types of local telephone network.

1/87-6/1987 **Rutgers University, New Brunswick, New Jersey.**  
*Part-time Instructor:* Taught the graduate course Forecasting and Time Series Analysis in the Department of Industrial Engineering.

9/84-7/1986 **Consilium Associates, Inc., Mountain View, California. (Acquired by Applied Materials in 1998)**  
*Computer-Aided Manufacturing (CAM) Software Developer*

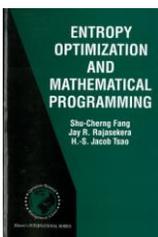
Participated in the development of a Computer-Aided Manufacturing (CAM) software system for management and automation of semiconductor wafer fabrication plants. In charge of the research, system analysis, original design and development for Statistical Control Procedures System. Also had charge of the development, maintenance and implementation of Non-lot Tracking and Data Collection System.

## PUBLICATION

### Books:



**Testing and Quality Assurance for Component-Based Software**  
J. Gao, H.-S.J. Tsao and Y. Wu, Artech House Publishers,  
September 2003.



**Entropy Optimization and Mathematical Programming**  
S.-C. Fang, J.R. Rajasekera and H.-S.J. Tsao,  
Kluwer Academic Publishers, September, 1997.

## Papers Published in Refereed Journals (45 Papers)

“Mathematical Models of Political Districting for More Representative Governments,” Liu, H., Erdogan, A., Lin, R. & Tsao, H.-S. J, to appear in *Computers and Industrial Engineering*, 2020.

“A General Intuitive Design Pattern for Optimally Sequencing Treatment Combinations in  $2^k$  Factorial Experiment and a Simple Estimation Algorithm,” Tsao, H.-S.J. and Patel, N., *Computers and Industrial Engineering*, Vol. 85, pp. 423-436, 2015.

“An Intuitive Design Pattern for Sequentially Estimating Parameters of a  $2^k$  Factorial Experiment with Active Confounding Avoidance and Least Treatment Combinations,” Tsao, H.-S.J. and Patel, N., *Computers and Industrial Engineering*, Vol. 66, pp. 601-613, 2013.

“Efficient Space Dedication to Bus Rapid Transit or Light Rail Systems,” Tsao, H.-S.J. and Pratama, A., *Journal of Public Transportation*, Vol. 16, No. 3, pp. 79-94, 2013.

“A Maximum-Entropy Approach to Minimizing Resource Contention in Aircraft Routing for Optimization of Airport Surface Operations,” Tsao, H.-S. J. and Pratama, A., *International Journal of Information and Decision Sciences, Special Issue on Information Entropy*, Vol. 3, No. 4, pp. 372-391, 2011.

“ICT Leap-frogging Enabled by Cloud Computing for Emerging Economies: A Case on Streamlining India’s Grain Supply Chains,” Tsao, H.-S. J., Venkatsubramanyan, S., Parikh, S., and Sarkar, P., *International Journal on Advances in ICT for Emerging Regions*, Vol. 4, No. 2, pp. 37 – 51, 2011.

“Revisiting the Note on Supply Chain Integration in Vendor-Managed Inventory,” Wang, W.T., Wee, H.M., and Tsao, H.-S.J., *Decision Support Systems*, Vol. 48, pp. 419-420, 2010.

“Forward Apportionment of Censored Counts for Discrete Nonparametric Maximum Likelihood Estimation of Failure Probabilities,” Patel, N. and Tsao, H.-S.J., *International Journal of Reliability, Quality and Safety Engineering*, Vol. 16, No. 3, pp. 213-234, 2009.

“Operational Feasibility of One-dedicated-lane Bus Rapid Transit/Light-rail Systems,” Tsao, H.-S. J., Wei, W., and Pratama, A, *Transportation Planning and Technology*, Vol. 32, No. 3, pp. 239-260, 2009. Also translated into Chinese and published in *Urban Transport of China*, Vol. 8, No. 2, March 2010, pp. 80-93.

“Command Steering of Trailers and Command-steering-based Optimal Control of an Articulated System for Tractor-track Following,” Rangavajhula, K. and Tsao, H.-S.J., *Journal of Automobile Engineering*, Vol. 222, No. 6, pp. 935-954, 2008.

“Optimal Sequencing of Test Conditions in  $2^k$  Factorial Experimental Design for Run-Size Minimization,” Tsao, H.-S.J. and Liu, H., *Computers and Industrial Engineering*, Vol. 55, pp. 450-464, 2008.

“A Simulation Study of the Productivity of Large Trucks with Shorter Trailers,” Dessouky, Y., Tsao, H.-S.J. , Patel, M., Zeta, J.B., and Zhou, L., *International Journal of Industrial and Systems Engineering*, Vol. 2, No. 3, pp. 261-285, 2007.

“Active Trailer Steering Control of an Articulated System with a Tractor and Three Full Trailers for Tractor-track Following,” Rangavajhula, K. and Tsao, H.-S.J., *International Journal of Heavy Vehicle Systems*, Vol. 14, No. 3, pp. 271-293, 2007.

”Effect of Multi-Axle Steering on Off-Tracking and Dynamic Lateral Response of Articulated Tractor-Trailer Combinations,” Rangavajhula, K. and Tsao, H.-S.J., *International Journal of Heavy Vehicle Systems*, Vol. 14, No. 4, pp. 376-401, 2007.

“A Method for Identifying a Minimal Set of Test Conditions in  $2^k$  Experimental Design,” H.-S..J. Tsao and I.W. Wibowo, *Computers and Industrial Engineering*, Vol. 48, pp. 141-151, 2005.

“An Automated Highway System Dedicated To Inter-City Trucking: Design Options, Operating Concepts And Deployment,” H.-S.J. Tsao and J.L. Botha, *Intelligent Transportation Systems Journal (The ITS Journal)*, Vol. 7, No. 2, pp. 169 – 196, 2002.

“Entropic Perturbation Method for Solving Systems of Linear Inequalities,” S-H. Chen, S.-C. Fang and H.-S.J. Tsao, *Journal of Computational and Applied Mathematics*, Vol. 145, pp. 133 – 149, 2002.

"A Framework for Evaluating Deployment Strategies for Intelligent Transportation Systems", Tsao, H.-S. J., *Intelligent Transportation Systems Journal (ITS Journal)*, Vol.6, pp. 141-173, 2001.

"Entrance Capacity of an Automated Highway System," Randolph W. Hall, Ali Nowroozi and H.-S. Jacob Tsao, *Transportation Science*, Vol. 50, No. 1, pp. 19 – 36, 2001.

“The Emergence of a Cognitive Car Following Driver Model with Application to Rear-End Crashes with a Stopped Lead Vehicle,” Misener, J.A., Tsao, H.-S.J., Song, B., and Steinfeld, A, *Transportation Research Record 1724*, pp. 29-38, 2000.

"An Axiomatic Approach to Developing Partial Automation Concepts for Deployment of Automated Highway Systems and Partial Invocation of Vision-Based Lane-Keeping and Adaptive Cruise Control," H.-S.J. Tsao, *Transportation Research Record*, No. 1651, 1998.

"Intermediate Automation Concepts for Evolution toward Automated Highway Systems," M. Al-Kadri, H. Benouar, and H.-S.J. Tsao, *Transportation Research Record*, No. 1651, 1998.

- "From the Guest Editor," H.-S.J. Tsao, Special Issue of the *Intelligent Transportation Systems Journal* (ITS Journal) on Automated Highway Systems, 1998.
- "Perturbing Dual Feasible Region for Solving Convex Quadratic Programs", S.C. Fang and H.-S.J. Tsao, *Journal of Optimization Theory and Applications*, Vol. 94, No. 1, pp. 73-85, July, 1997.
- "Analytical Models for Vehicle/Gap Distribution on Automated Highway Systems", H.-S.J. Tsao, R.W. Hall, and Indrajit Chatterjee, *Transportation Science*, Vol. 31, No. 1., pp. 18-33, 1997.
- "Traffic Analysis for Highway-to-Highway Interchanges on Automated Highway Systems: Congestion in Absence of Dedicated Ramps", Ran, B., Johnson, S., Leight., S, and Tsao, H.-S.J., *Transportation Research Record 1588: Planning and Administration; Highway Operations, Capacity, and Traffic Control*, pp. 145-151, 1997.
- "A Weak Law of Large Numbers for a Class of Non-Stationary Vector ARMA Processes with One Unit Root," H.-S. J. Tsao, *Stochastic Analysis and Applications*, Vol. 14, No. 3 , pp. 369-382, 1996.
- "Solving Linear Programs with Inequality Constraints via Perturbation of Feasible Region", S.C. Fang and H.-S.J. Tsao, *Optimization*, Vol. 37, pp. 213-223, 1996.
- "On the Entropic Perturbation and Exponential Penalty Methods for Linear Programming", S.C. Fang and H.-S.J. Tsao, *Journal of Optimization Theory and Applications*, Vol. 90, No. 1, July, 1996.
- "An Efficient Computational Procedure for Solving Entropy Optimization Problems with Infinitely Many Linear Constraints", S.C. Fang and H.-S.J. Tsao, *Journal of Computational and Applied Mathematics*, Vol. 72, pp. 127-139, 1996.
- "A Dual Perturbation View of Linear Programming", S.C. Fang and H.-S.J. Tsao, *Mathematical Methods of Operations Research*, Vol. 44, No. 1, pp. 1-10, 1996.
- "Linear Programming with Inequality Constraints via Entropic Perturbation", H.-S.J. Tsao and S.C. Fang, *International Journal of Mathematics and Mathematical Sciences*, Vol. 19, No.1, pp. 177-184, 1996.
- "The Shortest Path with at Most L nodes in Each of the Series/Parallel Clusters," W.-J. Li, H.-S.J. Tsao and O. Ulular, *Networks*, Vol. 26, pp. 263-271, 1995.
- "Linearly-Constrained Entropy Maximization Problem with Quadratic Costs and Its Applications to Transportation Planning Problems," S.C. Fang and H.-S.J. Tsao, *Transportation Science*, Vol. 29, No.4, pp. 353-365, 1995.
- "An Unconstrained Dual Approach to Solving Karmarkar-Type Linear Programs Using Conventional Barrier Functions", H.-S.J. Tsao and S.C. Fang, *ZOR - Mathematical Methods of Operations Research*, Vol. 42, No. 3, pp. 325-343, 1995.

"Traffic Control for Automated Highway Systems: A Conceptual Framework", H.-S.J. Tsao, *Transportation Research, Part C*, Vol. 3, No. 4, pp. 227-246, 1995.

"Stage Definition for AHS Deployment and an AHS Evolutionary Scenario", H.-S.J. Tsao, *Intelligent Vehicle Highway Systems Journal (IVHS Journal)*, Vol.2(4), pp. 359-382, 1995.

"A Staggered-Diamond Design for Automated/Manual-HOV Highway-to-Highway Interchanges and Constraints on AHS Design for Accommodating Automated Highway Change", H.-S.J. Tsao, *Intelligent Vehicle Highway Systems Journal (IVHS Journal)*, Vol.2(3), pp. 281-292, 1995.

"Constraints on Initial AHS Deployment and the Concept Definition of a Shuttle Service for AHS Debut", H.-S.J. Tsao, *Intelligent Vehicle Highway Systems Journal (IVHS Journal)*, Vol. 2(2), 159-173, 1995.

"A Quadratically Convergent Global Algorithm for the Linearly-Constrained Minimum Cross-Entropy Problem," S.C. Fang and H.-S.J. Tsao, *European Journal of Operations Research*, Vol. 79, No. 2, 369-378, 1994.

"A Probabilistic Model for AVCS Longitudinal Collision/Safety Analysis", H.-S.J. Tsao and R.W. Hall, *Intelligent Vehicle Highway Systems Journal (IVHS Journal)*, Vol.1, No. 3, pp. 261-274, 1994.

"Linear Programming with Entropic Perturbation," S.C. Fang and H.-S.J. Tsao, *Zeitschrift fur Operations Research*, Vol. 37, No. 2, pp. 171-186, 1993.

"A Bayesian Interpretation of the Linearly-Constrained Cross-Entropy Minimization Problem," H.-S. J. Tsao, S.-C. Fang and D.N. Lee, *Engineering Optimization*, Vol. 22, No. 1, pp. 65-75, 1993.

"An Unconstrained Convex Programming Approach to Solving Convex Quadratic Programming Problems," S.C. Fang and H.-S.J. Tsao, *Optimization*, Vol. 27, pp. 235-243, 1993.

"On the Optimal Entropy Analysis," H.-S. J. Tsao, S.-C. Fang and D.N. Lee, *European Journal of Operational Research*, Vol. 59, pp. 324-329, 1992.

### **Book Chapters (Invited and Peer-Reviewed)**

"Entropy Optimization: Shannon Measure of Entropy and Its Properties", Fang, S.-C., and Tsao, H.-S.J., *Encyclopedia of Optimization*, Vol. 2, pp. 12 – 18, Kluwer Academic Publishers, 2001.

"Entropy Optimization: Interior Point Methods", Fang, S.-C., and Tsao, H.-S.J., *Encyclopedia of Optimization*, Vol. 2, pp. 4 – 8, Kluwer Academic Publishers, 2001.

"Principle of Maximum Entropy: Image Reconstruction", Fang, S.-C., and Tsao, H.-S.J., *Encyclopedia of Optimization*, Vol. 3, pp. 245 – 249, Kluwer Academic Publishers, 2001.

"Automated Highway System Deployment: A Preliminary Assessment of Uncertainties", Hall, R.W. and Tsao, H.-S.J., Chapter 16 of *Automated Highway Systems*, P.A. Ioannou (editor), Plenum Press, New York, pp. 325 - 334, 1997.

"The Development of Automated Vehicle Guidance Systems - Commonalities and Differences Between the State of California and the Netherlands", Bart van Arem and H.-S. Jacob Tsao, in *Advances in Intelligent Transportation System Design*, Society of Automotive Engineers, Warrendale, Pa., pp. 81 - 91, 1997.

### **Papers Published in Recent Conference Proceedings**

"Simulating Performance for One-Dedicated-Lane Light Rail System - A Case Study," Dessouky, Y; Valladares<sup>G</sup>; Valladares, C; Patel, M.; and Tsao, H.-S.J., presented at 4th International Joint Conference on Industrial Engineering and Operations Management, Lisbon-Amadora, Military Academy, Portugal, on July 18-20<sup>th</sup>, 2018; published in the proceedings.

"A Human-centered Credit-banking System for Convenient, Fair and Secure Carpooling among Members of an Association," Tsao, H.-S. J. and Eirinaki,M.; presented at the 3<sup>rd</sup> International Conference on the Human Side of Service Engineering, as part of the 6th International Conference on Applied Human Factors and Ergonomics (AHFE 2015) and the Affiliated Conferences, July 26 – 30, 2015, Caesars Palace, Las Vegas, U.S.A.; published in the Conference Proceedings, pp. 2507 – 2514.

"An Extra Trailer To Double Truck-Bus Capacity Of India Via Automated Trailer Steering," Rangavajhula, K., Shrivastava, P., and Tsao, H.-S.J., presented at the 2012 Sadar Patel International Conference on Recent Advances In Engineering, Technology And Management, held at the Sadar Patel College of Engineering (affiliated with University of Mumbai), Mumbai, India, on May 31, 2012 – June 2, 2012; published in the Conference Proceedings.

"Achieving Any Desired Resolution in  $2^k$  Experimental Design and Avoiding Confounding Among Estimates of Any Given Set of Effects or Interactions," Tsao, H.-S. J. and Patel, M.H., presented at the 41<sup>st</sup> Annual Conference of Computers and Industrial Engineering held in Los Angeles, USA and published in the Conference Proceedings, 2011.

"Dodge-Romig Acceptance Sampling Plans: Misuse and Modification for Practical Usefulness," Tsao, H.-S.J. and Ganguly, A., presented at the 2011 Industrial Engineering Research Conference held on Reno, Nevada on May 21- 25, 2011 and published in the Proceedings.

"Integer Programming for Student Program Design and Scheduling," Patel, Minnie H., Tsao, H.-S. Jacob, and Abdollahi, Zahra J., presented at the 2011 Industrial Engineering Research Conference held on Reno, Nevada on May 21- 25, 2011 and published in the Proceedings.

"Streamlining Grain Supply Chains of India: Cloud Computing and Distributed Hubbing for Wholesale-Retail Logistics," Tsao , H.-S. J., Parikh, S., Ghosh, A.S., Pal, R.,

Ranalkar, M., Tarapore, H., and Venkatsubramanian, S., presented at 2010 IEEE International Conference on Service Operations and Logistics, and Informatics (IEEE-SOLI 2010), held on July 15-17, 2010 in Qingdao, Shandong, China; published in the conference proceedings, pp. 252 - 257.

“An Optimization Architecture for Airport Surface Operations,” Tsao, H.-S.J. and Wei, W., published as Paper #09-2909 in the Proceedings of *Transportation Research Board 2009 Annual Meeting*, Washington, D.C., 2009.

“Launching Bus Rapid Transit with Only One Dedicated Lane for Two-Way Bus Traffic on Congested Corridors,” Tsao, H.-S.J., Wei, W., Pratama, A., and Tsao, J.R., presented at the 2<sup>nd</sup> Annual Conference of Indian Subcontinent Decision Science Institute (ISDSI 2009) held on Jan. 3-5, 2009 in Mumbai, India and published in the Proceedings, pp. 113-125.

“Integrated Taxiing and Take-Off Scheduling for Optimization of Airport Surface Operations,” Tsao, H.-S.J., Wei, W., and Pratama, A., presented at the 2<sup>nd</sup> Annual Conference of Indian Subcontinent Decision Science Institute (ISDSI 2009) held on Jan. 3-5, 2009 in Mumbai, India and published in the Proceedings, pp. 126-138.

“Operational Feasibility of One-dedicated-lane Bus Rapid Transit/Light-rail Systems,” H.-S. J. Tsao, Wenbin Wei, and Agus Pratama, presented at the 7<sup>th</sup> International Conference of Chinese Transportation Professionals, May 21-22, 2007, Shanghai, China; published in the Proceedings.

“Global Technology Initiative Study-Tour to Asia at San Jose State University,” Belle Wei and H.-S. Jacob Tsao, presented at the 2007 American Society for Engineering Education Annual Conference & Exposition held in Honolulu, Hawaii, June 24-27, 2007; published in the Proceedings.

“Active Command-Steering Control of Tractor and Three Full Trailers for Tractor-track Following,” Rangavajhula, K. and Tsao, H.-S.J. (2006), presented at International Mechanical Engineering Congress and Exposition, Chicago, Nov. 5 -10, 2006 and published in the Proceedings.

“Studying Offshoring Through a Study-Tour of Taiwan and China,” by Belle Wei and H.-S. Jacob Tsao, Proceedings of the 2005 American Society for Engineering Education Annual Conference & Exposition, Portland, Oregon, June 12 - 15, 2005.

“An Automated Bus System With Shuttle-Centered Convoying And Intra-Convoy Transfer: Operations And Evaluation” by H.-S. Jacob Tsao and Lan Zhang, Proceedings of the Transportation Research Board 2005 Annual Meeting, Washington D.C., January 2005.

“An Intuitive View of the Simplex Algorithm and Sensitivity Analysis for LP via the Concept of Virtual Values of the Right-hand-side Requirements,” H.-S.J. Tsao, presented at the 34<sup>th</sup> International Conference on Computers and Industrial Engineering, San Francisco, Nov. 2004, published in the conference proceedings.

"Minimization of Test Conditions in Experimental Design," H.-S.J. Tsao and I.W. Wibowo, presented at the 31<sup>st</sup> International Conference on Computers and Industrial Engineering, San Francisco, Feb. 2003, published in the conference proceedings.

"An Automated Highway System Dedicated To Inter-City Trucking: Operating Concepts And Deployment," H.-S.J. Tsao and J.L. Botha, presented at the 2002 Annual Meeting of the Transportation Research Board on Jan. 14, 2002, Washington, D.C.

"Operating Concepts for Urban Bus Automation and Inter-city Truck Automation," H.-S.J. Tsao and J.L. Botha, presented at the 2001 IEEE ITS Conference held in August, 2001 in Oakland, California and published in the Conference Proceedings, 2001.

"Testing a Decision-Oriented Framework to Understand ITS Deployment Issues: Lessons Learned from the TravInfo ATIS Project," M. A. Miller and H.-S.J. Tsao, Proceedings of the 6th World Congress on Intelligent Transport Systems, Toronto, Canada, November 8-12, 1999.

"Capacity of Automated Highway Systems: Merging Efficiency," R. W. Hall and H.-S. J. Tsao in *Proceedings of American Control Conference*, Albuquerque, New Mexico, June, 1997, pp. 2046-2050.

"Driver Intelligence Replacement in a Decision-Oriented Deployment Framework for Driving Automation", H.-S.J. Tsao and Ran, B., *Proceedings of The Third World Congress on Intelligent Transportation Systems*, Orlando, Florida (1996).

"Leveraging Exogenous Events for the Deployment of Automated Highway Systems", Hanson, M. and H.-S.J. Tsao, *Proceedings of The Third World Congress on Intelligent Transportation Systems*, Orlando, Florida (1996).

"Concept Definition of an Infrastructure-Supported Automated Highway System", Sengupta, R., Godbole, D. and H.-S.J. Tsao, *Proceedings of The Third World Congress on Intelligent Transportation Systems*, Orlando, Florida (1996).

"Towards a Macroscopic Formulation Approach for Dynamic Traffic Flow on an AHS", Ran, B. and H.-S.J. Tsao, *Proceedings of IVHS America 5th Annual meeting* (August, 1994).

"A Functional Architecture for Automated Highway Traffic Planning", H.-S.J. Tsao, *Proceedings of 4th Annual Meeting of IVHS America*, Atlanta, Georgia (April 1994).

"A Bayesian Analysis of Entropy Optimization for Uncertainty Modeling", S.C. Fang, D.N. Lee and H.-S.J. Tsao, *Proceedings of The Second International Symposium on Uncertainty Modeling and Analysis (ISUMA '93)*, College Park, Maryland (April 1993).

"Design Options for Operating Automated Highway Systems" H.-S.J. Tsao, R.W. Hall and S.E. Shladover, *Proceedings of Vehicle Navigation & Information Systems Conference* (Oct.1993).

"Entropy Optimization and Bayesian Parameter Estimation," H.-S. J. Tsao, S.-C. Fang and D.N. Lee, *Conference Proceedings of Advances in Mathematics, Computations and Reactor Physics* (April, 1991).

### **Selected Recent Non-Refereed Reports**

"Development and Field Testing of An Interactive Transit Station Information System (ITSIS) Using Connected Vehicle Technologies," Meng, H., Tsao, H.-S.J., Zhou, K., Picar, J., Mizuno, B. & Zhang, W.-B., Institute of Transportation Studies, University of California at Berkeley, June 2017; <https://escholarship.org/uc/item/1dm2q3hf> .

"Bus Rapid Transit (BRT) Toolbox: BRT Person Throughput-Vehicle Congestion Tradeoffs," Li, J.-Q., Tsao, H.-S. J., Chan, C.-Y., Zhou, K. and Zhang, W.-B., Research Report UCB-ITS-PRR-2015-02, Institute of Transportation Studies, University of California at Berkeley, March, 2015; <http://escholarship.org/uc/item/90z0n86b> .

"Developing Operating Rules and Simulating Performance for One-Dedicated-Lane Bus Rapid Transit/Light Rail Systems," Tsao, H.-S. J., Dessouky, Y., Ingham, K., Ongkowitzojo, R. and Tsao, J.R., PATH Research Report UCB-ITS-PRR-2010-01, Institute of Transportation Studies, University of California at Berkeley, March, 2010.

"Integrated Taxiing and Take-Off Scheduling with Reordering at Runway Holding Points for Optimization of Airport Operations," Tsao, H.-S.J., Wei, W., and Pratama, A., research report submitted to NASA as a deliverable for the project entitled "*Integrated Approaches for Surface Traffic Optimization in the Presence of Uncertainties*," and presented at the 2009 Institute for Operations Research and Management Science (INFORMS) Annual Meeting held in San Diego, USA on Oct. 11 – 14, 2009.

*Annual Report for the Research Project of Integrated Approach for Airport Surface Traffic Optimization Under Uncertainties*, Wei, W., Poage, J., Davis, D., Cheng, V., Tsao, J., Martin, J., Seo, A., Fu, C., Pratama, A., Corker, K., Fan, Z., and Ho, L., submitted to NASA by San Jose State University Human Automation Interaction Laboratory (HAIL), October 2009.

*Annual Report for the Research Project of Integrated Approach for Airport Surface Traffic Optimization Under Uncertainties*, Wei, W., Poage, J., Davis, D., Cheng, V., Tsao, J., Martin, J., Seo, A., Fu, C., Pratama, A., Corker, K., and Ho, L.; submitted to NASA by San Jose State University Human Automation Interaction Laboratory (HAIL), October 2008.

"Feasibility of One-Dedicated-Lane Bus Rapid Transit/Light-Rail Systems and Their Expansion to Two-Dedicated-Lane Systems: A Focus on Geometric Configuration and Performance Planning," Tsao, H.-S. J , Wei, W., and Pratama, A., MTI Report 08-01, Mineta Transportation Institute, San Jose State University, San Jose, California, U.S.A., 2008.

"Statistical Process Control for Within-Piece and Lot-To-Lot Variability," Mujde Uysal And H.-S. Jacob Tsao (2007); portions presented at the 2008 Annual Conference of the Institute of Industrial Engineers, Vancouver, Canada, May, 2008.

“Automatic Steering For Conventional Truck Trailers: Development And Assessment Of Operating Concepts For Improving Safety, Productivity And Pavement Durability - Final Report,” Tsao, H.-S.J., Dessouky, Y., Rangavajhula, K, Zeta, J.B., and Zhou, L., PATH Research Report UCB-ITS-PRR-2006-8, Institute of Transportation Studies, University of California, Berkeley, 2006.

“Evaluation of Bus and Truck Automation Operations Concepts,” H.-S. Jacob Tsao, Lan Zhang, Lin Lin, and Beepa Batni, California PATH Research Report UCB-ITS-PRR-2004-45 (283 pages), California Partners for Advanced Transit and Highway (PATH), University of California, Berkeley, 2004.

“Identification of Minimal Sets of Test Conditions in Experimental Design,” H.-S.J. Tsao and I. Wibowo (draft), presented at INFORMS (Institute for Operations Research and Management Science) Fall 2002 National Meeting, San Jose, California, Nov. 17-20,2002.

“The Performance of R and S Control Charts for Mixtures of Two Normal Distributions,” A. Berrado and H.-S.J. Tsao, presented at INFORMS (Institute for Operations Research and Management Science) Fall 2002 National Meeting, held in San Jose, California, Nov. 17-20,2002.

“Definition and Evaluation of Bus and Truck Automation Operations Concepts,” H.-S. Jacob Tsao and Jan Botha, California PATH Research Report, UCB-ITS-PRR-2002-8, Institute of Transportation Studies, University of California, Berkeley, 2002.

“The Role Of Intelligent Transportation Systems (ITS) In Intermodal Air Cargo Operations,” H.-S.J. Tsao and A. Rizwan, Research Report UCB-ITS-RR-2000-5, Institute of Transportation Studies, University of California, Berkeley, 2000.

"Empirical Analysis of Airport Capacity Enhancement Impacts: A Case Study of DFW Airport," M. Hansen, H.-S. J. Tsao, A. Huang, and W. Wei, presented at the 1999 Transportation Research Board Annual Meeting, Washington, D.C., 1999.

"Spatial and Temporal Factors in Estimating the Potential of Carpooling for Demand Reduction in a Simplified Urban Sprawl," H.-S. Jacob Tsao and Da-Jie Lin, California PATH Research Report UCB-ITS-PRR-99-2, 1999.

"The Role of Air Cargo in California's Goods Movement," Jacob Tsao, UCB-ITS Research Report UCB-ITS-RR-98-7, University of California at Berkeley, Institute of Transportation Studies, Sept. 1998.

"Dynamic Traffic Assignment for Automated Highway Systems: Final Report for MOU 162", H.-S.J. Tsao and B. Hongola, California PATH Reports to Caltrans 97-C14, PATH Program, Institute of Transportation Studies, University of California, Berkeley, 1997.

"A Comparison of Traffic Models: Part II, Results", H.K. Lo, W.-H. Lin, L.C. Liao, E. Chang, and H.-S.J. Tsao, PATH Research Report UCB-ITS-PRR-97-15, Institute of Transportation Studies, University of California, Berkeley, 1997.

"Traffic Flow Analysis for an Automated Highway System", Ran, B. and H.-S.J. Tsao, presented at the Transportation Research Board 1996 Annual Meeting, Washington, D.C.  
"Dynamic Traffic Assignment for Automated Highway Systems: A Two-Lane Highway with Speed Constancy", H.-S.J. Tsao, Working Paper UCB-ITS-PWP-96-12, PATH Program, Institute of Transportation Studies, University of California, Berkeley, 1996.

A Comparison of Traffic Models: Part I, Framework", H.K. Lo, W.-H. Lin, L.C. Liao, E. Chang, and H.-S.J. Tsao, PATH Research Report UCB-ITS-PRR-96-22, Institute of Transportation Studies, University of California, Berkeley, 1996.

"Estimating Dynamic O-D Matrices Using Advanced Technologies", Ran, B., H.-S.J. Tsao, and C.C. Liao, presented at the 7th World Conference on Transport Research (WCTR), Sydney, Australia, July 1995.

"Human Factors Design for Automated Highway Systems: Second Generation Scenarios", H.-S.J. Tsao, T.A. Plocher, W.B. Zhang, and S.E. Shladover, draft US-DOT FHWA Report, under FHWA Contract No. DTFH61-91-C-00100, (Jan. 14, 1994).

"Human Factors Design of Automated Highway Systems: First Generation Scenarios", H.-S.J. Tsao, R.W. Hall, S.E. Shladover, T.A. Plocher and L.J. Levitan, US-DOT FHWA Report FHWA-RD-93-123 (1993).

"Two-Point and Multi-Point Routing Algorithms for Private-Network Circuit Layout," W.-J. Li, H.-S. J. Tsao and O. Ulular, Bell Laboratory Technical Memorandum 51253-910811-01TM (Sept., 1991).

### **Invited Conference Tutorial**

"Entropy Optimization and Mathematical Programming," S.-C. Fang, J.R. Rajasekera and H.-S.J. Tsao, based on the book under the same title, taught at INFORMS Spring Meeting, San Diego, CA, May, 1997.

### **Recent Presentations Made at International Conferences (without a Paper)**

"Mindset, Knowledge and Ability for Innovation and Entrepreneurship in Technology," H.-S.J. Tsao (as the PI of a \$599,642, four-year and graduate NSF scholarship program), a 75-minute workshop invited by and conducted at the *2019 S-STEM Symposium* co-sponsored by the National Science Foundation (NSF) and American Association for the Advancement of Science (AAAS), Washington, D.C., Sept. 12 – 14, 2019.

"Practical Mathematical Methods for Political Redistricting and Competitive and Fair Elections" Liu, H., Erdogan, A., Lin, R. & Tsao, H.-S. J, INFORMS International, Taipei, Taiwan, June 16 – 20, 2018.

"Multiple Linear Regression with Partitioned data," Sivankutty, S. and Tsao, H.-S.J., presented at the 2016 Annual Conference of the Institute of Industrial and Systems Engineers, Anaheim, California, May 21-24, 2016.

“A General Intuitive Design Pattern for Optimally Sequencing Treatment Combinations in  $2^k$  Factorial Experiment and a Simple Estimation Algorithm,” Tsao, H.-S.J. and Patel, N., presented at the 2014 Institute for Operations Research and Management Science (INFORMS) Annual Meeting held in San Francisco, USA on Nov. 9 – 12, 2014. A paper with the same title has appeared in *Computers and Industrial Engineering*, Vol. 85, pp. 423-436, 2015.

“Minimum Number of Runs for  $2^k$  Factorial Design in Blocks,” Tsao, H.-S.J. and Patel, N., presented at the 2012 Annual Conference of the Institute of Industrial Engineers, San Juan, Puerto Rico, May 18-22, 2012.

“Connecting Nested  $2^k$  Fractional Factorial Designs with Optimal Treatment-Combination Sequencing,” Tsao, H.-S.J. and Patel, N., presented at the 2012 Annual Conference of the Institute of Industrial Engineers, Orlando, Florida, USA, May 19-23, 2012.

“Integrated Estimation Procedure for Within-piece, Piece-to-Piece and Lot-to-Lot Standard Deviations for SPC ,” H.-S. Jacob Tsao and Krishna Rangavajhula, presented at the 2008 Annual Conference of the Institute of Industrial Engineers, Vancouver, Canada, May 17-21, 2008.

“The performance of R and S Control Charts for Mixtures of Two Normal Distributions,” presented at the INFORMS (Institute for Operations Research and Management Science) 2002 National Meeting, San Jose, California, Nov. 17 – 20, 2002.

“Identification of Minimal Sets of Test Conditions in Experimental Design,” H.-S.J. Tsao and I. Wibowo (draft), presented at INFORMS (Institute for Operations Research and Management Science) 2002 National Meeting, San Jose, California, Nov. 17 – 20, 2002.

#### **EXTERNALLY FUNDED RESEARCH PROJECTS AS PI OR CO-PI SINCE JOINING SJSU IN AUG. 1999 (Totaling \$2,010,000)**

- **National Science Foundation, “Silicon Valley Innovation and Entrepreneurship Scholarships (SVIES) Program” (Award Number 1458794): total budget of \$599,642 for 120 semester scholarships of \$5K or \$4K at the College of Engineering of San Jose State University; PI (with Dr. Ahmed Hambaba, Professor of Computer Engineering, as the co-PI); Feb 15, 2015 – Jan. 31, 2020.**
- University of California at Berkeley, Institute of Transportation Studies, “Concept of Operations for An Interactive Transit Station Information System (ITSIS) Using Connected Vehicle Technologies,” funded by California Department of Transportation, Division of Research and Innovation (via California Partners for Advanced Transit and Highways headquartered – PATH - at UCB); \$40,000 subcontract to H.-S.J. Tsao; Sept. 2016 – Aug. 2017.
- University of California at Berkeley, Institute of Transportation Studies, “Bus Rapid Transit (BRT) Toolbox: BRT Person Throughput - Vehicle Congestion Tradeoffs,” funded by California Department of Transportation, Division of Research and

Innovation (via California Partners for Advanced Transit and Highways headquartered at UCB); \$25,000 subcontract to H.-S.J. Tsao; July 2013 – Feb. 2014.

- **National Aeronautics and Space Administration (NASA), “*Integrated Approaches for Surface Traffic Optimization in the Presence of Uncertainties*,” \$1M, co-PI (with Dr. Wenbin Wei of SJSU Department of Aviation and Technology as PI and Dr. Belle Wei, Dean of College of Engineering, also as co-PI), Jan. 2008 – Dec. 2009.**
- California Department of Transportation, Division of Research and Innovation (via California Partners for Advanced Transit and Highways), “Developing Operating Rules and Simulating Performance for One-dedicated-lane Bus Rapid Transit/Light Rail Systems,” \$25,000 (seed funds for an Innovative Research Topic), PI (with Yasser Dessouky of SJSU-ISE as co-PI), Aug. 2008 – July 2009.
- California Department of Transportation, Division of Research and Innovation (via Mineta Transportation Institute at Lucas Graduate School of Business of San Jose State University), “*Bus Rapid Transit/Light Rail Implemented on One Dedicated Lane: Operational Feasibility, Practicality and Systems Analysis*,” \$62,000, PI (with Dr. Wenbin Wei of SJSU Department of Aviation and Technology as co-PI), Jan. 2007 – Dec. 2007.
- California Partners for Advanced Transit and Highways, “Automated Steering for Conventional Truck Trailers: Development and Assessment of Operating Concepts for Improving Safety, Productivity and Pavement Durability,” \$58,948, PI (with Dr. Yasser Dessouky of SJSU-ISE as co-PI), October 1, 2004 – September 30, 2005.
- California Partners for Advanced Transit and Highways, “Evaluation of Truck and Bus Automation Scenarios,” (Phase II of the previous research project) \$124,897, Co-PI (with Jan Botha of SJSU-CEE), July, 2002 – Dec. 31, 2003.
- California Partners for Advanced Transit and Highways, “Definition and Evaluation of Bus and Truck Automation Operations Concepts,” \$89,288, PI (with Jan Botha of SJSU-CEE as Co-PI), Jan. 2001 - June 30, 2002
- National Center of Excellence for Air Transportation Operations Research (NEXTOR - a research consortium sponsored by the Federal Aviation Administration and its industrial and government-agency partners), “Intelligent Transportation Systems (ITS) Technology in Intermodal Air Freight,” \$10,000, PI, Aug. 1999 - Dec. 1999.

## **PROFESSIONAL SERVICES AND JOURNAL EDITORSHIP**

- 2/18-12/18 Member, International Program Committee of the 48th International Conference on Computers & Industrial Engineering, December 2-5, 2018, Auckland, New Zealand.
- 1/17-10/17 Member, International Program Committee of the 47th International Conference on Computers & Industrial Engineering, October 11-13, 2017, Lisbon, Portugal.

- 4/16-7/16 Member, International Program Committee; "Big Data Analytics for Optimizing Supply Chains", an international conference jointly organized by the SP Jain Institute of Management and Research (SPJIMR) of Mumbai, India and the India Chapter of Production and Operations Management Society (POMS); 7/29-30/2016; SPJIMR's Mumbai, India campus.
- 10/10-9/15 Area Editor of Statistics, Quality and Reliability for Computers and Industrial Engineering, an international journal published by Elsevier.**
- 7/15 – 11/15 Member; 10<sup>th</sup> International Program Committee, IEEE International Conference on Service Operations, Logistics and Informatics (SOLI 2015); November 15-17, 2015, Yasmine Hammamet, Tunisia.
- 6/13 – 9/14 Program Co-chair, The 5<sup>th</sup> International Conference on Systematic Innovation (ICSI), July 16-18, 2014, San Jose, California, USA.
- 3/14 – 7/14 Member; 9<sup>th</sup> International Program Committee, IEEE International Conference on Service Operations, Logistics and Informatics (SOLI 2014); October 8-10, 2014, Qingdao, Shandong, China.
- 3/13 – 7/13 Member; 8<sup>th</sup> International Program Committee, IEEE International Conference on Service Operations, Logistics and Informatics (SOLI 2013); Dongguan, China; July 28-30, 2013.
- 3/12 – 7/12 Member; 7<sup>th</sup> International Program Committee, IEEE International Conference on Service Operations, Logistics and Informatics (SOLI 2012); Suzhou, China; July 8-10, 2012.
- 3/06-2/10 Member, Vehicle Design Committee of the American Society of Mechanical Engineers (ASME)**
- 9/11-6/12 Member, Advisory Committee, International Conference on Recent Advances in Engineering, Technology and Management, May 31 - June 2, 2012, Sardar Patel College of Engineering, Bhavan's Campus, Mumbai.
- 5/11-11/11 Member, Program Committee of the 41st International Conference on Computers & Industrial Engineering, October 23-26, 2011 at University of Southern California, Los Angeles, California, U.S.A.
- 3/11-8/11 Member, International Program Committee, 6th International Conference on Service Operations and Logistics, and Informatics, July 10-12, 2011, Beijing, China.
- 6/04 - 12/04 Program Co-Chair for the 34<sup>th</sup> International Conference on Computer and Industrial Engineering, San Francisco, California, Nov. 14 - 16, 2004.

- 10/03 – 7/04 Guest Editor, Special Issue of Computers and Industrial Engineering for for the 31<sup>st</sup> International Conference on Computers and Industrial Engineering held in San Francisco, California, Feb. 2 – 4, 2003.
- 2/97 – 1/03 Member of Transportation Network Modeling Committee, Transportation Research Board (TRB), National Academy of Sciences.
- 6/02 - 2/03 Program Co-Chair for the 31<sup>st</sup> International Conference on Computers and Industrial Engineering, San Francisco, California, Feb. 2 – 4, 2003.
- 7/01 - 11/02 Members of the Program Committee and the Local Arrangements Committee for the INFORMS (Institute for Operations Research and Management Science) Fall 2002 National Meeting, San Jose, California, Nov. 17-20,2002.
- 10/00-8/01 Program committee member for the IEEE Conference on Intelligent Transportation Systems, Oakland, California, August 25 - 29, 2001.
- 7/98 – 4/99 Member of the Organizing Committee for the International Workshop on Geographic Information Systems for Transportation (GIS-T) and Intelligent Transportation Systems (ITS), April 26-28, 1999, Hong Kong
- 1/97 - 6/98 Guest editor for a special issue of the Intelligent Transportation Systems Journal (ITS Journal) on automated highway systems, published in Oct. 1998.**
- 12/96 - 11/97 Program Committee member for the IEEE Conference on Intelligent Transportation Systems, Boston, Massachusetts, Nov. 9-12, 1997.