

DR. H.-S. JACOB TSAO

Department of Industrial & Systems Engineering

San Jose State University

San Jose, California 95192-0085

Office Phone: (408) 924-4088

FAX: (408) 924-4040

Cell Phone: (925) 413-8688

jacob.tsao@sjsu.edu

<http://www.engr.sjsu.edu/jtsao>



EDUCATION

- Ph.D.** University of California, Berkeley
Ph.D. in Operations Research, September 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

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

COURSES TAUGHT

Advanced Operations Research (Graduate)
Management Science (Two-year MBA; One-year MBA)
Quality Assurance and Reliability (Graduate)
Quality Engineering and Six Sigma (Graduate; MBA)
Design and Analysis of Statistical Experiment (Graduate and Undergrad.)
Systems Engineering (undergraduate and graduate)
Information Engineering (Graduate)
Introduction to Operations Research (Undergraduate)
Engineering Probability and Statistics (Undergraduate)

SHORT COURSES TAUGHT IN BUSINESS AND INDUSTRIAL SETTINGS

- Design of Experiments (16 hours) for Applied Materials
- Fundamentals of Statistics (20 hours) at Boston Scientific – Target
- Statistical Quality Control (16 hours) at Center for Applied Competitive Technologies (CACT), De Anza College.

LECTURES FOR NON-ACADEMIC OR GENERAL PUBLIC

- “Silicon Valley Innovations and Entrepreneurs – From the Vacuum Tube to YouTube.” (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, longer or shorter.)

WORK EXPERIENCE

8/99-present **Department of Industrial and Systems Engineering
San Jose State University, San Jose, California**
Associate Professor; Full Professor; Director of Graduate Program

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.

Conducting research into design of efficient statistical experiments (minimization of number of test runs, optimal sequencing of tests, etc.); design of efficient public-transportation systems (e.g., bus rapid transit or BRT systems); design of freight-transportation vehicles and 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 for medical-device and biotech firms of the Silicon Valley.

Fall 2009, **SP Jain Institute of Management and Research**
Summer 2010 **Mumbai, India**
Summer 2012 *Visiting Professor*
Summer 2013

In Fall 2009, taught Management Science for a one-year intensive MBA program and also for a two-year MBA program. Also conducted research, with a seed fund from IBM, and developed research proposals on SmarterPlanet, a recent IBM initiative. Studied the grain supply chains of India, among others. In Summer 2010 and Summer 2012, taught Management Science again for a one-year intensive MBA program and also for a two-year MBA program. Continued research on India’s grain supply chain. Investigated into how to increase the productivity of India’s trucking industry with technologies and new operational concepts..

May 2010 **Visiting Scholar, Four Top Universities Beijing and Xi’an, China**

Visited four universities and gave five seminars. Visited Department of Industrial Engineering of Tsinghua University in Beijing, Department of

Management Science of People's University of China (Renmin University) in Beijing, School of Traffic and Transportation and Department of Transportation Management Engineering of Beijing Jiao Tong University in Beijing, and Department of Computer Science and Department of Communication of Xidian University (Xi'an University of Electronics and Technology) in Xi'an.

12/08-present **Efficis Inc., San Ramon, California**

President

Consulting for Silicon Valley companies, e.g., for Genencor (originally a joint venture between Genentech and Corning and currently a division of the Danish bio-tech firm Danisco) on design of experiments for bio-tech. Research on development of efficient operating concepts for large vehicles, including buses and trucks.

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, quadratic and semi-infinite 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 \$200-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.

6/88-2/92 **AT&T Bell Laboratories, Holmdel, New Jersey.**

Member of Technical Staff (Network Transport and 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).

7/86-6/88 **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.

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

9/84-7/86 **Consilium Associates, Inc., Mountain View, California.**
Computer-Aided Manufacturing (CAM) Software Development Engineer

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.

AWARDS

2011-2012 **Teacher-Scholar**
San Jose State University

2011 **The Applied Materials Award for Excellence in Teaching**
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

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 (43)

“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., to appear in *Computers and Industrial Engineering*.

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

Peer-reviewed Papers Published in Recent Conference Proceedings

"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 41st Annual Conference of Computers and Industrial Engineering held in Los Angeles, USA and published in the 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 2nd 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 2nd 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 7th 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 34th 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 31st 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

“Developing Operating Rules and Simulating Performance for One-Dedicated-Lane Bus Rapid Transit/Light Rail Systems,” Tsao, H.-S. J., Dessouky, Y., Ingham, K., Ongkowitzo, 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)

"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.

- California Department of Transportation, Division of Research and Innovation (via California Partners for Advanced Transit and Highways - PATH), "Bus Rapid Transit (BRT) Toolbox: BRT Person Throughput - Vehicle Congestion Tradeoffs," Research Contractor for this \$100K PATH Project, with Roberto Horowitz of PATH as PI and Wei-Bin Zhang of PATH as Project Manager.
- 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 Aeronautics, “Replacing Acoustical Airport Counters With Affordable, Reliable, Automated Equipment: A Practical Research,” \$250,000, co-PI (with Dr. Wenbin Wei of Department of Aviation and Technology of SJSU as PI); contract issued by California Department of Transportation in 2008; intellectual-property rights, copy rights and performance period being renegotiated.
- 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

- 9/10-present Area Editor of Statistics, Quality and Reliability for Computers and Industrial Engineering, an international journal published by Elsevier.
- 6/13 – 9/14 Program Co-chair, The 5th International Conference on Systematic Innovation (ICSI), July 16-18, 2014, San Jose, California, USA

- 3/13 – 7/13 Member; 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; 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, 2011 International Conference on Service Operations and Logistics, and Informatics, July 10-12, Beijing, China.
- 6/04 - 12/04 Program Co-Chair for the 34th 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 31st 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 31st 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.

SERVICE TO THE SAN JOSE STATE UNIVERSITY

Department of Industrial and Systems Engineering

- Graduate Advisor, responsible for admission, advising for all ISE graduate students, graduation, etc.; Spring 2000 – present (including all summer terms);
- Curriculum Committee: Fall 1999 - present

College of Engineering, San Jose State University

- Serving on the Task Force 2015 from Fall 2009 through Spring 2011.
- Served as a member of the College of Engineering (COE) Retention, Tenure and Promotion (RTP) Committee in Fall 2010.
- Served as the Chair of the Sabbatical Leave Committee for College of Engineering in Fall 2010.
- Assisted Professor Raghu Agarwal of Mechanical and Aerospace Engineering in planning and executing a two-week study tour of India in Winter 2008 as part of the Global Technology Initiative sponsored by the College of Engineering; the three themes of the study tour were: global economy, sustainable development (energy and environment), and social responsibility.
- Planned and executed a two-week study tour of China and Taiwan in Summer 2006 as part of the Global Technology Initiative sponsored by the College of Engineering; the three themes of the study tour were: global economy, sustainable development (energy and environment), and social responsibility.
- Planned and executed a two-week study tour of China and Taiwan in Summer 2005 as part of the Global Technology Initiative sponsored by the College of Engineering; the three themes of the study tour were: global high-tech supply/value chain, innovation and entrepreneurship, and energy and environment.
- Planned and executed a two-week study tour of China and Taiwan in Summer 2004 as part of the Global Technology Initiative sponsored by the College of Engineering to study global supply/value chain for high-tech industries; received a College of Engineering Special Appreciation Award in Fall 2004 and also 2005 College of Engineering McCoy Family Outstanding Service Award.
- Served as a member of the College of Engineering (COE) Retention, Tenure and Promotion (RTP) Committee in Fall 2008.
- Served as a member of the Graduate Studies and Research Committee of College of Engineering from Fall 2004 through Spring 2008.
- Served as a member of the Sabbatical Leave Committee for College of Engineering in Fall 2003.
- Served as Chair of the Committee for Review of Dr. Louis Freund's Performance as the Chair of the Department of Industrial and Systems Engineering at SJSU, Fall 2004
- Served on the Teaching Excellence Task Force, College of Engineering; Fall 2002;

- The Steering Committee of the Master of Science in Engineering (MSE) Program; Fall 2001 – Fall 2003
- Student Affair Committee; Fall 2001 – spring 2003
- Student Recruitment Committee; Fall 2001 – Spring 2003
- Engineering Math. Task Force: Fall 1999.

REFERENCES

Professor Pravin Varaiya

Nortel Networks Distinguished Professor

Department of Electrical Engineering and Computer Science

University of California, Berkeley

Berkeley, CA 94720

Phone: (510) 642-0348

FAX: (510) 642-6330

E-mail: varaiya@eecs.berkeley.edu

Professor Shu-Cherng Fang

Walter Clark Chair Professor of Industrial Engineering

Graduate Program in Operations Research

BOX 7913

North Carolina State University

Raleigh, NC 27695

Phone: (919) 515-2192

FAX: (919) 515-5281

E-mail: fang@eos.ncsu.edu

Professor Randolph Hall

Vice President of Research

University of Southern California

Professor, Daniel J. Epstein Department of Industrial and Systems Engineering

240C Gerontology

University of Southern California

University Park - MC 0193

Los Angeles, CA 90089-0193

Phone: (213) 740-4894

FAX: (213) 740-1120

E-mail: hall@atlas.usc.edu

Professor Adib Kanafani

Department of Civil and Environmental Engineering

(Former Department Chair and Former Director of UC Berkeley Institute of Transportation Studies)

109 McLaughlin Hall

University of California, Berkeley

Berkeley, CA 94720

Phone: (510) 642-8739

FAX: (510) 643-5264

E-mail: kanafani@ce.berkeley.edu

Dr. Kan Chen, Professor Emeritus
Founding Editor-in-Chief, Intelligent Transportation Systems Journal

Department of Electrical Engineering and Computer Science

University of Michigan, Ann Arbor

Mailing address:

1 Baldwin Avenue, Suite 802

San Mateo, CA 94401

Phone: (415) 375-8890

FAX: (415) 375-8582

PERSONAL INFORMATION

U.S. Citizen