DR. H.-S. JACOB TSAO

**Professor and Director of MS in Industrial
and Systems Engineering (MS-ISE) Program
Department of Industrial & Systems
Engineering;
Associate Dean for Extended Studies
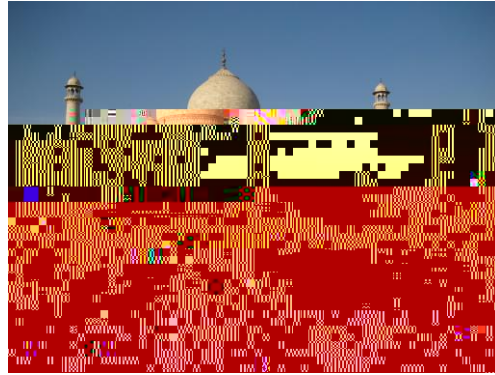College of Engineering;
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EDUCATION

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)

WORK

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

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.

imal Sequencing of Test Conditions in 2^k Factorial Experimental Design for Run-   -S.J. and Liu, H., *Computers and Industrial Engineering*, Vol. 55, pp. 450-464, 2008.

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.

                                                        tem with a Tractor and Three Full Trailers for Tractor-   -S.J., *International Journal of Heavy Vehicle Systems,* Vol. 14, No. 3, pp. 271-293, 2007.

                        -Axle Steering on Off-Tracking and Dynamic Lateral Response of Articulated Tractor-   -S.J., *International Journal of Heavy Vehicle Systems,* Vol. 14, No. 4, pp. 376-401, 2007.

                                                2^k Experimental   -S..J. Tsao and I.W. Wibowo, *Computers and Industrial Engineering*, Vol. 48, pp. 141

"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-

"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

Ranalkar, M., Tarapore, H., and Venkatsubramanyan, 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.

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 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.

axiing and Take-Off Scheduling for Optimization of Airport Surface -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.

-dedicated-lane Bus Rapid Transit/Light-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.

-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.

-Steering Control of Tractor and Three Full Trailers for Tractor-track -S.J. (2006), presented at International Mechanical Engineering Congress and Exposition, Chicago, Nov. 5 -10, 2006 and published in the Proceedings.

udy- 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.

-Centered Convoying And Intra-Convoy -S. Jacob Tsao and Lan Zhang, Proceedings of the Transportation Research Board 2005 Annual Meeting, Washington D.C., January 2005.

Concept of Virtual Values of the Right-hand- -S.J. Tsao, presented at the 34th International Conference on Computers and Industrial Engineering, San Francisco, Nov. 2004, published in the conference proceedings.

-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.

-City Trucking: Operating Concepts
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.

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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.

-Oriented Framework to Understand ITS Deployment Issues: Lessons
. 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,

in 2^k 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

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 (N *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**

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;

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.