

Raja Sengupta

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Civil & Environmental Engineering
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Education

Ph.D., Systems Engineering, EECS Department, University of Michigan, February 1995

Dissertation area: An optimal control theory for discrete event systems

M.S., Systems Engineering, EECS Department, University of Michigan, May 1991

Major area: Control Systems, Minor area: Artificial Intelligence.

B.S., Electrical Engineering, Jadavpur University, Calcutta, India, May 1988

Concentration areas: Instrumentation, Power Systems, Drives

Honors and Awards

Berkeley Energy and Climate Lectures Curriculum Innovation Award, 2014,
<http://www.ce.berkeley.edu/news/801>

USDOT Connected Vehicle Technology Award 2011

Academic Experience

Associate Professor, Systems Program, Civil and Environmental Engineering, University of California-Berkeley, July 2007 to present.

Assistant Professor, Systems Program, Civil and Environmental Engineering, University of California-Berkeley, July 2001 to June 2007.

Professor, Systems Program, Civil and Environmental Engineering, University of California-Berkeley, July 2012 to present.

Research: Papers at <https://scholar.google.com/citations?user=MLqZ0wkAAAAJ&hl=en>. 8,500 citations, h-index 40. My research is in systems prototyping and theory. My contributions are to Unmanned Air Vehicles, Car-to-Car Networking, Wireless Networks, Theories of Real-time Estimation over Networks, Cyber-Physical Systems, and Behavior Change Technology. Links describing some of this work are:

- Behavior Change Technology: <http://gogreen.berkeley.edu>, <http://xmobile.berkeley.edu>, <http://automatic.com>, <http://www.humanintellectlab.com/>
- Unmanned Air Vehicles: <http://c3uv.berkeley.edu/>, <http://www.airphrame.com/>, <http://www.lightcense.co/>

- *Cyber-Physical Cloud Computing*: <http://cpcc.berkeley.edu/>
- *Car-to-Car Networking*: <http://youtu.be/HCFI96NK40o>

Teaching: *My teaching is in systems engineering at the graduate and undergraduate level. I also teach an introduction to programming for the College of Engineering.*

- *CE 186 Design of Cyber-Physical Systems. Systems design in the intersection of Energy and Transportation. Cloud to Embedded Programming.*
- *CE191 Systems Analysis: Linear Programming, Dynamic Programming, Gradient Descent, Mixed Integer Linear Programming taught in the context of case studies from infrastructure systems.*
- *CE 290I Control of Large-Scale Systems: Agile Systems Development over the Internet using Java, Formal language design syntax and semantics using ANTLR, Systems problems as L1, L2, L-infinity optimization, safety properties and liveness properties in LTL, State Space models using Simulink, State machines, TCP/IP and RPC, Synchronous Model of Computation.*
- *E7: Introduction to Programming for Engineers. 400+ students.*
- *Programming the Mobile Cloud, LEAD program for Under-represented Minority High-School Students, Summer 2011, Summer 2012.*

Professional Engineering Experience

Assistant Research Engineer, California PATH, University of California, Berkeley, April 1995 to May 1998, December 1998 to May 2001:

- Principal Researcher of the PATH Communication LAB
- Principal Investigator for ONR project on Distributed Autonomous Agent Networks
- Principal researcher for CALTRANS MOU 332 on fault detection in the wireless intra-platoon communication network.
- Leader of the National Automated Highway System Consortium (NAHSC) Safety Evaluation team [17, 19]. Developed two of the four AHS architectures studied by the NAHSC.
- Principal Researcher for CALTRANS MOU 207 on advanced traveler information system evaluation in southern California.

Senior Scientist, Mitretek Systems, June 1998 to November 1998:

- Provided technical advice to the USDOT Intelligent Transportation Systems (ITS) Joint Programs Office.

Research Assistant, EECS Department, University of Michigan, September 1989 to February 1995:

- Published an optimal control theory for discrete event systems in the SIAM journal of control and optimization and in the journal of discrete event systems.

- Published a theory of fault diagnosis for discrete event systems published as two articles in the IEEE transactions on automatic control.
- Published a discrete time optimal control algorithm for dynamic traffic assignment [25] published in the journal of transportation research.
- Developed a distributed traffic signal control algorithm based on rolling horizon dynamic programming.
- Developed a protocol for CI bus arbitration in DEC VAX clusters.

Trainee Engineer, Calcutta Electric Supply Company, India, August 1988 to December 1988

Research Supervision

Doctoral Research Ongoing

- The BiAgent Model, Eloi Pereira
- Spatial Queuing Theory and Cyber-Physical Cloud Computing, Jiangchuan Huang
- Changing Traveler Behavior using Sentiment Analysis, Andre Carrel (with J. Walker)
- Robust Localization and Behavior Change, Venkatesan Ekambaram (with K. Ramachandran)

Doctoral Research Chaired

- Eloi Pereira, Logical Space Programming: The BigActor Approach, Summer 2015
- Jiangchuan Huang, From Real Vehicle to Virtual Vehicle, Summer 2014
- Jerald Jariyasunant: Spring 2012 BCT
- Ching-ling Huang: Fall 2011 C2C
- Christian Manasseh: Fall 2010 BCT, SCS
- [Cooperative vehicle safety](#), Shahram Rezaei, 2008
- [Network-Level Control of Collaborative UAVs](#), Joshua Love, 2011, (with J.K. Hedrick)
- [A framework for the development of traffic control systems](#), Doctoral Research of Marco Zennaro, 2008
- [Routing and monitoring algorithms for UAVs](#), Doctoral Research of Sivakumar Rathinam, Spring 2007
- [Control, estimation, and communication design applied to active vehicle safety systems](#), Qing Xu, 2005 (with J.K. Hedrick)

Doctoral Research Co-Advised

- Traveler Satisfaction Surveys meet Mobile Phone and Vehicle Tracking: Linking Individual Experiences to Travel Habit Changes with Panel Data, Andre Carrel, 2015 (with J. Walker)
- [Localization using multidimensional scaling \(LMDS\)](#), Duke Lee, 2005 (With P. Varaiya)

- [Coordinated control of unmanned aerial vehicles](#), Peter Seiler, 2001 (with J.K. Hedrick)

Post-doctoral Supervision

- Dr. Aislan Foina, Visiting Fellow, University of Sao Paolo, March 2015 to present
- Dr. Yaser Fallah, NSERC Fellow, University of British Columbia, Wireless Networking for Cars, 2009-2011. Current Assistant Professor West Virginia University.
- Dr. Eric Frew, Stanford University, Control of Unmanned Air Vehicles, 2005 – 2006. Currently Professor University of Colorado.
- Dr. ZuWhan Kim, University of Southern California, Image Processing in Unmanned Air Vehicles, 2002 – 2008. Currently at Google.

Academic Service

- Member CEE Curriculum Committee 2007-2011
- Member CEE Systems Program Committee 2007-2012
- Member CEE Executive Committee 2008
- Undergraduate Advisor, CEE 2007-2009
- Graduate Advisor, CEE:Systems Program, 2010-2011
- Member College E7 Committee 2008 - 2011
- Member of 1 College Promotion and Tenure Committee
- Member of 2 Campus Promotion and Tenure Committees

Professional Service

- Chair Technical Committee on Smart Cities, IEEE Control Systems Society.
- Steering Committee Member, for The 1st International Symposium on Wireless Sensor Networks for Developing Countries (WSN4DC), Jamhoro Pakistan, April 2013
- General Chair of IEEE WiVEC workshop on Vehicular Networks, September 2011.
- Keynote speaker at the 5th ACM SIGSPATIAL Workshop on Computational Transportation Science.2010
- Co-Program Chair of the 2nd International Symposium of Vehicular Computing Systems, 2008
- Keynote Speaker, IEEE WiVEC workshop on Vehicular Networks, 2008
- Theme Chair for Control in Transportation Systems, at the American Control Conference, October 2007

Professional Service

- Expert Witness, Havens vs. Mobex, Federal Court in the 3rd Circuit, New Jersey, 2014.
- Consultant to the Department of Transportation, Intelligent Transportation Systems, City Government of Shenzhen, China, June 2012.

- Served as a NATO RTA Consultant on Unmanned Air Vehicles, in 2006, 2007, and 2008 to promote US-European coordination of research on Unmanned Air Vehicles.
- Currently Advisor to the PITVANT project, Portugal Air Force and University of Porto, Portugal.

Research Management Experience

- **PI** UCConnect project on Text Mining for Traveler Behavior, \$70,000. 1-Sept-2015, 30-April-2016
- **PI** NASA UARC project on the Air Parcel Model, \$118,726. 1-June-2015, 30-Mar-2016
- **PI** of FHWA VPPP project on Parking Pricing on the Berkeley Campus, \$360,000, 1-Sept-2014, 30-June-2016
- **PI** of CITRIS Seed Project on Creating Mobile Laboratories for Studying Human Behavior: Is Unhealthy Eating a Matter of Price or Preference?, Sep-11, Dec-12, \$60,000, Sept-2011, Dec-2012
- **PI** of ERSO-NSF project, : CPS: Medium Making Cloud Computing Sense, Act, and Move(SAM), Sep-11, Aug-14, \$1,100,000
- **PI** of XLAB - Development of Xmobile Platform from Vice-Chancellor for Research, awarded February 2011, \$15,000.
- **PI** of Xmobile platform funding from Dean of Social Science Research, awarded February 2011, \$15,000.
- **PI** of XMobile X0120 CALANNUAL/PARENTS fund from Dean of Haas, awarded February 2011, \$15,000.
- Co-PI of ERSO contract# CCF-0729237, NSF, Reduced Infrastructure Cost in Transportation Systems through Intelligent Signal Processing, Sep-7, Aug-10, \$600,010.00
- **PI** of ITS contract# 65A0208-TO-6615, Caltrans, California Connected Traveler: SAFE TRIP-21, 1-May-08, 30-Sep-09, \$985,068.
- **PI** of ITS contract# 65A0208-TO-6608, Caltrans, CICAS Urban and Suburban Assisted Left-Turn (USUAL) System, 1-Jul-06, 30-Sep-09, \$2,931,250.
- **PI** of ITS contract# 20082280, Telesaurus LLC, Feasibility of a Wide-Area Wireless ITS Network, Jan-08, Dec-08, \$119,999.
- Co-PI of ITS Contract # N00014-07-C-0225 DOD-ONR, Berkeley Robust Aerobot Information Network, 24-Jul-07, 15-Oct-09, \$2,091,222.
- Co-PI of ITS Contract # 65A0208 TO 6217, Caltrans, VII California Development and Deployment: Proof of Concept, Nov-05, Jun-09, \$3,641,261.00
- **PI** of Navy STTR Phase II Contract # N00014-02-M-0236 with Advanced Ceramics Research, Tucson, AZ, \$335,000, for July 2002 – December 2005.
- **PI** of Integrated Multi- Channel Vehicle-Vehicle and Vehicle-Roadside Communications for ITS, Caltrans, \$ 177, 039 for 2005 - 2007.
- **PI** of Robust, Mobile, Low-Delay Wireless Communications for Intelligent Automotive Safety Applications, Toyota, \$ 289,964 for 2004 - 2007.
- **PI** of ITS contract# TCS70709, General Motors, Cooperative Vehicle Safety: Research and Demonstration, General Motors, Feb-05, Jun-07, \$651,266
- **PI** of ITS Band Roadside to Vehicle Communications in a highway Setting - Protocol Layer, Caltrans, \$ 500,000 for 2005 - 2008. Fix?

- **PI** of ITS contract# ND0434500, General Motors, Safety and Convenience Algorithm Evaluation Simulation (SCAESim) Research, Sep-6, Aug-07, \$208,216.
- **PI** of Architecture for Vehicle Infrastructure Integration Motorola, \$65,000 for 2006.
- **PI** of Real-Time Java for UAV Control, IBM, \$ 80,000 for 2006.
- Co-PI: Development and Validation of Autonomous and Collaborative Unmanned Aerial Vehicles, ONR, \$ 240,000 for 2006.
- Co-PI: TASK Addition: Distributed Collaboration with Limited Communication and Vision-based Tracking, AFOSR, \$ 666,400 for 2006.

I. Refereed Publications

A. Journal Articles

1. Sengupta, R. and S.A. Lafortune, "A Graph-Theoretic Optimal Control Problem for Terminating Discrete Event Processes," *Journal of Discrete Event Dynamical Systems: Theory and Applications* 2, September 1992, pp. 139-72.
(Contribution: 75%)
2. Lafortune, S., R. Sengupta, D.E. Kaufman, and R.L. Smith, "Dynamic System-Optimal Traffic Assignment Using A State Space Model," *Transportation Research, Part B (Methodological)*, December 1993, Vol.27B, No. 6, pp.451-72.
(Contribution: 40%)
3. Sampath, M., R. Sengupta, S. Lafortune, K. Sinnamohideen, and D. Teneketzis, "Diagnosability of Discrete-Event Systems," *IEEE Transactions on Automatic Control*, Sept. 1995, Vol. 40, No. 9, pp. 1555-75.
(Contribution: 30%)
4. Sampath, M., R. Sengupta, S. Lafortune, K. Sinnamohideen, and D.C. Teneketzis, "Failure Diagnosis Using Discrete-Event Models." *IEEE Transactions on Control Systems Technology*, March 1996, Vol. 4 No. 2, pp. 105-24. Derived from ref-proceeding no. 5.
(Contribution: 30%)
5. Godbole, D.N., R. Sengupta, J. Misener, N. Kourjanskaia, and J.B. Michael, "Benefit Evaluation of Crash Avoidance Systems," *Transportation Research Record*, January 1998, Vol. 1621, pp. 1-9.
(Contribution: 40%)
6. Sengupta, R. and S. Lafortune, "An Optimal Control Theory for Discrete Event Systems," *SIAM Journal on Control and Optimization*, March 1998, Vol. 36, No. 2, pp. 488-541.
(Contribution: 75%)
7. Michael, J.B., D.N. Godbole, J. Lygeros, and R. Sengupta, "Capacity Analysis of Traffic Flow Over a Single-lane Automated Highway System," *ITS Journal*, August 1998, Vol. 4, No. 1-2, pp. 49-80.
(Contribution: 25%)

8. **Carbaugh, J.**, D.N. Godbole, and R. Sengupta, " Safety and capacity analysis of automated and manual highway systems," *Transportation Research, Part C (Emerging Technologies)*, 1998, Vol. 6C, No. 1-2, Elsevier, pp.69-99. Derived from nonref-report no. 16.
(Contribution: 33%)
9. Godbole, D.N., N. Kourjanskaia, R. Sengupta and M. Zandonadi, "Breaking the Highway Capacity Barrier: Adaptive Cruise Control-Based Concept" *Transportation Research Record* No: 1679, Paper No. 99-0749, January 1999.
(Contribution: 25%)
10. **Jain, R.**, Puri, A. and Sengupta, R., "Geographical Routing Using Partial Information for Wireless Ad Hoc Networks," *IEEE Personal Communications*, Vol. 8, No. 1, IEEE, P. 1-10. 21 references. Derived from nonref-report no. 18.
(Contribution: 33%)
11. **Seiler, P.** and R. Sengupta, "A Bounded Real Lemma For Jump Systems," *IEEE Transactions on Automatic Control*, September 2003, Vol. 48, No. 9, pp. 1651-1654.
12. **Ergen, M., D. Lee, R. Datta, J. Ko** and A Puri, R. Sengupta and P. Varaiya, "Comparison of Wireless Token Ring Protocol," *IEEE 802.11. Journal of Internet Technology*, February 2004, Vol. 4, No. 4, pp. 261-276.
(Contribution: 15%)
13. **Seiler, P.** and R. Sengupta, "An H_∞ Approach to Networked Control," *IEEE Transactions on Automatic Control*, January 2005, Vol. 50, No. 3, pp. 356-364.
14. **Ergen, M., D. Lee**, R. Sengupta and P. Varaiya, "WTRP-Wireless Token Ring Protocol," *IEEE Transactions on Vehicular Technology*, January 2004, Vol. 53, No. 6, pp. 1863-1861.
(Contribution: 20%)
15. Lee, D., P. Varaiya and R. Sengupta, "Trigonometric k-clustering," *In the Wiley IEEE Press Monograph on Sensor Network Operations*, Shashi Phoha, Thomas F. La Porta and Christopher Griffin (Editors), January 2006, ISBN: 041719765, pp. 1-33.
(Contribution: 20%)
16. **Rathinam, S**, R. Sengupta and S. Darbha, "A Resource Allocation Algorithm for Multivehicle Systems with Nonholonomic Constraints," *IEEE Transactions on Automation Science and Engineering*, January 2007, Vol. 4, No. 1, pp. 98-104. Derived from ref-proceeding no. 54. Listed as Accepted During Last Promotion Case
(Contribution: 30%)
17. **Xu, Q., T. Mak**, J. Ko and R. Sengupta, "Medium Access Control Protocol Design for Vehicle-Vehicle Safety Messages," *IEEE Transactions on Vehicular Technology*, March 2007, Vol. 56, No. 2, pp. 499-518. Listed as Accepted During Last Promotion Case
(Contribution: 25%)
18. **Rezaei, S.** and R. Sengupta, "Kalman Filter-Based on Integration of DGPS and Vehicle Sensors for Localization," *IEEE Transactions on Control Systems Technology*, November 2007, Vol. 15, No. 6, pp. 1080-1088, doi: 10.1109/TCST.2006.886439. Derived from ref-

- proceeding no. 49. Listed as Accepted During Last Promotion Case
(Contribution: 50%)
19. Sengupta, R., **S. Rezaei**, S. Shladover, D. Cody, S. Dickey and H. Krishnan, "Cooperative Collision Warning Systems: Concept Definition and Experimental Implementation," *Journal of Intelligent Transportation Systems*, July 2007, Vol. 11, No. 3. Listed as Accepted During Last Promotion Case
(Contribution: 50%)
 20. **Mak, T.**, K. Laberteaux, R. Sengupta and M. Ergen, "Multi-Channel Medium Access Control for Dedicated Short Range Communications," *IEEE Transactions on Vehicular Technology*, January 2009, Vol. 58 (1), pp. 349-366, doi: 10.1109/TVT.2008.921625.
(Contribution: 25%)
 21. **Rathinam, S.**, Z. W. Kim and R. Sengupta, "Vision-Based Monitoring of Locally Linear Structures Using an Unmanned Aerial Vehicle," *Journal of Infrastructure Systems*, March 2008, Vol. 14, No. 1, pp. 52-63, doi: 10.1061/(ASCE)1076-0342(2008)14:1(52).
(Contribution: 20%)
 22. **Rathinam, S.** and R. Sengupta, "Algorithms for Routing Problems Involving UAV's. In Innovations in Intelligent Machines-1," *Springer Series on Studies in Computational Intelligence*, August 2007, Vol. 70.
(Contribution: 50%)
 23. Shladover, S. E., **G. Polatkan**, R. Sengupta, J. VanderWerf, M. Ergen and B. Bougler, "Dependence of Cooperative Vehicle System Performance on Market Penetration," *Transportation Research Record: Journal of the Transportation Research Board No. 2000*, November 2007, doi: 10.3141/2000-15.
(Contribution: 20%)
 24. **Huang, C.L.**, Y.P. Fallah, R. Sengupta and H. Krishnan, "Adaptive Intervehicle Communication Control for Cooperative Safety Systems," *IEEE Network*, January 2010, Vol. 24, Issue 1, pp. 6-13, doi: january/february 2010 6 0890-8044/10/.
(Contribution: 30%)
 25. **Manasseh, C.** and R. Sengupta, "Middleware to Enhance Mobile Communications for Road Safety and Traffic Mobility Applications," *The Institution of Engineering and Technology, IET Intelligent Transport Systems - Special Issue*, January 2010, Vol. 4, Issue 1, pp. 24-36, doi: 10.1049/iet-its.2009.0019.
 26. **Rathinam, S.** and R. Sengupta, "3/2 Approximation Algorithm for two Variants of a 2-Depot Hamiltonian Path Problem," *Operations Research Letters*, January 2010, Vol. 38, Issue 1, pp. 63-68, doi: 10.1016/j.orl.2009.10.001.
 27. **Rezaei, S.**, R. Sengupta, H. Krishnan, **X. Guan** and **R. Bhatia**, "Tracking the Position of Neighboring Vehicles Using Wireless Communications," *Transportation Research Part C*, June 2010, Vol. 18, Issue 3, pp. 335-350, doi: 10.1016/j.trc.2009.05.010.
(Contribution: 30%)

28. Fallah, Y.P., **C.L. Huang**, R. Sengupta and H. Krishnan, "Analysis of Information Dissemination in Vehicular Ad-Hoc Networks With Application to Cooperative Vehicle Safety Systems," *IEEE Transactions on Vehicular Technology*, January 2011, Vol. 60, No. 1, pp. 233-247, doi: 10.1109/TVT.2010.2085022.
(Contribution: 30%)
29. **Huang, C.L.**, Y.P. Fallah, R. Sengupta and H. Krishnan, "Intervehicle Transmission Rate Control for Cooperative Active Safety System," *IEEE Transactions on Intelligent Transportation Systems*, September 2011, Vol. 12, No. 3, pp. 645-658, doi: 10.1109/TITS.2010.2070873.
(Contribution: 30%)
30. **Huang, C.L.**, H. Krishnan, R. Sengupta and Y.P. Fallah, "Implementation and Evaluation of Scalable Vehicle-to-Vehicle Safety Communication Control," *IEEE Communications Magazine*, November 2011, Vol. 49, No. 11, pp. 134-141, doi: november 2011 134 0163-6804/11/.
(Contribution: 30%)
31. Nowakowski, C., **D. Vizzini**, S. Datta Gupta and R. Sengupta, "Evaluation of the Real-Time, Freeway End-Of-Queue Alerting System to Promote Driver Situational Awareness," *Transportation Research Record*, Paper 12-09991, February 2012. In Press
(Contribution: 25%)
32. **Jariyasunant, J.**, E. Mai and R. Sengupta, "Algorithm for Finding Optimal Paths in a Public Transit Network with Real-Time Data," *Transportation Research, Journal of the Transportation Research Board No. 2256*, Paper 11-3791, February 2012, Vol. 2256/2011, pp. 34-42, doi: 10.3141/2256-05, doi: 10.3141/2256-05. (Contribution: 30%)
- * 33. Ekambaram, V., K. Ramachandran and R. Sengupta, "Collaborative High Accuracy Localization in Mobile Multipath Environments," *IEEE Transactions on Vehicular Technology*, March 2013, Vol. PP, No. 99, doi: 10.1109/TVT.2013.2251754. (Contribution: 20%)
http://ieeexplore.ieee.org/xpls/abs_all.jsp?arnumber=6476037
- * 34. **Jariyasunant, J.**, M. Abou-Zeid, A. Carrel, V. Ekambaram, D. Gaker, R. Sengupta and J.L. Walker, "Quantified traveler: Travel feedback meets the cloud to change behavior," *Journal of Intelligent Transportation Systems*, September 2015, Vol. 19, No. 2, pp. 109-124.
(Contribution: 20%) <http://www.tandfonline.com/doi/abs/10.1080/15472450.2013.856714>
- * 35. **Carrel, A.**, P.S.C. Lau, R.G. Mishalani, R. Sengupta and J.L. Walker, "Quantifying Transit Travel Experiences from the Users' Perspective with High-Resolution Smartphone and Vehicle Location Data: Methodologies, Validation, and Example Analyses," *Transportation Research Part C: Emerging Technologies*, September 2015, Vol. 58, Part B, pp. 224-239, doi: 10.1016/j.trc.2015.03.021.
(Contribution: 20%)
<http://www.sciencedirect.com/science/article/pii/S0968090X15001060>

B. Papers in Refereed Conference Proceedings

1. Lafortune, S., R. Sengupta, D.E. Kaufman, and R.L. Smith, "A Dynamical System Model for Traffic Assignment in Networks," *Vehicle Navigation and Information Systems Conference. Proceedings, P-253 (IEEE Cat. No.91CH3091-6)*, Oct. 20-23 1991, Dearborn, MI, USA. Warrendale, PA, USA: Soc. Automotive Eng, 1991, pp. 701-8 Vol. 2, 1151 pp.
2. Sengupta, R. and S. Lafortune, (Edited by: Levis, A.H., Stephanou, H.E.), "Optimal Control of A Class of Discrete Event Systems. Distributed Intelligence Systems," Selected Papers from the *IFAC Symposium, Distributed Intelligence Systems*, August 13-15 1991, Arlington, VA, USA. Oxford, UK: Pergamon, 1992. p.29-34. ix+256 pp.
3. Sengupta, R., and S. Lafortune, "Extensions to The Theory Of Optimal Control Of Discrete Event Systems," *Proceedings of a Joint Workshop in Discrete Event Systems: Modeling and Control*, August 1992, Prague, Czechoslovakia. S. Balemi, P. Kozak, R. Smedinga, editors. Boston: Birkhauser, 1993. Vi, 230 p.
4. Sengupta, R. and S. Lafortune, "A Deterministic Optimal Control Theory for Discrete Event Systems," *Proceedings of 32nd IEEE Conference on Decision and Control*, December 15-17 1993, San Antonio, TX, USA. New York, NY, USA: IEEE, 1993, pp.1182-7 Vol.2, 4 Vol. 66+3898 pp.
5. Sampath, M., R. Sengupta, and S. Lafortune, K. Sinnamohideen, D. Teneketzis, "Failure Diagnosis using Discrete Event Models," *Proceedings of 1994 33rd IEEE Conference on Decision and Control*, December 14-16 1994, Lake Buena Vista, FL, USA. New York, NY, USA: IEEE, 1994, pp. 3110-16 Vol.3, 4 Vol. 4252 pp. 19 references. Ref-journal no. 4 was derived from this publication.
6. Michael, J.B., R. Sengupta, D.N. Godbole, and B. Hongola, "A Tool Framework For Assessing the Safety Properties of Automated Highway Systems," *Intelligent Transportation: Realizing the Benefits, Proceedings of the 1996 Annual Meeting of ITS America*.
7. Porche, I., M. Sampath, R. Sengupta, Y.-L. Chen, and S. Lafortune, "A Decentralized Scheme for Real-time Optimization of Traffic Signals," *Proceedings of the 1996 IEEE International Conference on Control Applications*, September 15-18 1996, Dearborn, MI, USA. New York, NY, USA: IEEE, 1996, pp.582-9, 1117 pp.
8. Misener, J., A. Deshpande, D.N. Godbole, R. Sengupta, B. Michael, and M. Broucke, "Application of Design and Evaluation Tools to the Automated Highway System," *Intelligent Transportation: Realizing the Future, Abstracts of the Third World Congress on Intelligent Transport Systems, 1996*.
9. Godbole, D.N., M. Miller, J. Misener, R. Sengupta, and J. Tsao, "An Infrastructure Assisted Concept for Automated Highway Systems," *Intelligent Transportation: Realizing the Future, Abstracts of the Third World Congress on Intelligent Transport Systems, 1996*, pp.1-9.
10. Misener, J.A., R. Sengupta, and D.N. Godbole, "Preliminary Study of the Application of Synthetic Vision for Obstacle Avoidance on Highways," *Proceedings of the SPIE - The*

International Society for Optical Engineering, April 21-22 1997, Vol.3088, (Enhanced and Synthetic Vision 1997, Orlando, FL, USA.) SPIE-Int. Soc. Opt. Eng, 1997, pp.225-34.

11. **Carbaugh, J.**, D. Godbole, and R. Sengupta, "Tools for Safety Analysis of Vehicle Automation Systems." *Proceedings of 16th American CONTROL Conference*, June 4-6 1997, Albuquerque, NM, USA. Evanston, IL, USA: American Autom. Control Council, 1997, pp.2041-5 Vol.3, 6 Vol. (lix + xi + xvii + xii + xvii + xii + 3994) pp.
12. Godbole, D. and R. Sengupta, "Tools For The Design of Fault Management Systems [Automated Highway Systems]," *Proceedings of Conference on Intelligent Transportation Systems*, Nov. 9-12 1997, Boston, MA, USA. New York, NY, USA: IEEE, 1997, pp.159-64. xii + 1088 pp.
13. Godbole, D.N., **V. Hagenmeyer**, R. Sengupta, and D. Swaroop, "Design of Emergency Manoeuvres for Automated Highway System: Obstacle Avoidance Problem," *Proceedings of the 36th IEEE Conference on Decision and Control*, Dec. 10-12 1997, San Diego, CA, USA. New York, NY, USA: IEEE, 1997, pp. 4774-9, Vol.5, 5 Vol. 5067 pp.
14. Godbole, D. N. and R. Sengupta, "Rear-End Crash Mitigation Benefits of an Automated Highway System," *Proceedings, Transportation technology for tomorrow*, ITS America Meeting, 1998. (8th: 1998: Detroit, Mich.)
15. Sengupta, R. and **A.E. Lindsey**, "A Methodology for the Integration of Vehicle Failure Diagnostics," *Proceedings, Transportation technology for tomorrow*, ITS America Meeting, 1998. (8th: 1998: Detroit, Mich.)
16. Godbole, D. N. and R. Sengupta, "A Method For Design and Specification of Longitudinal Controllers for Vehicle Automation," *Proceedings, Transportation Technology for Tomorrow*, ITS America Meeting, 1998. (8th: 1998: Detroit, Mich.).
17. Godbole, D., N. Kourjanskaia, R. Sengupta, and M. Zandonadi, "Methodology for an Adaptive Cruise Control Study Using the SHIFT/Smart-AHS Framework," *Proceedings, SMC 98 IEEE International Conference on Systems, Man, and Cybernetics*, October 11-14 1998, San Diego, CA, USA. New York, NY, USA: IEEE, 1998. p. 3217-22, Vol. 4-5, 4945 pp.
18. Godbole, D.N., R. Sengupta, and **V. Hagenmeyer**, "Distributed Hybrid Controls for Automated Vehicle Lane Changes." *Proceeding sof the 37th IEEE Conference on Decision and Control (Cat. No.98CH36171)*, Dec. 16-18 1998, Tampa, FL, USA. Piscataway, NJ, USA: IEEE, 1998. p. 2639-44, Vol. 3. 4 Vol. xcvi + 4756 pp.
19. Simsek, H.T., R. Sengupta, S. Yovine and F. Eskafi, "Fault Diagnosis for Intra-Platoon Communications," *Proceedings of the 38th IEEE Conference on Decision and Control (Cat. No.99CH36304)*, Dec. 7-10 1999, Phoenix, AZ, USA. Piscataway, NJ, USA: IEEE, 1999. pp. 3520-5 vol.4. 5 vol.(xvii+5325) pp.
20. **Seiler, P.** and R. Sengupta, "Analysis of Communication Losses in Vehicle Control Problems," Accepted to appear in the *Proceedings of the 2001 American Control Conference*, June 25-27 2001, Arlington, VA, USA.

21. Sengupta, R., "A Discrete Event Approach for Vehicle Failure Diagnostics: Tutorial on Failure Diagnosis of Dynamic Systems Using Discrete-event Models," *2001 American Control Conference*, June 25-27 2001 Arlington, VA, USA. Tutorial Paper.
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