

RAJENDRA G. KULKARNI

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Employment

Research Instructor

3/92 to Present

The School of Public Policy, George Mason University, Fairfax, VA.

Application of Nonlinear Dynamical Systems theory to model transportation and regional economics issues. Research and development of methodologies to study application of ITS to regional road networks and traffic. Development of regional economic models incorporating a suite of methods from the complexity theory- percolation theory, spin glasses, self organizing and adaptive systems, and deterministic chaos. Analysis and modeling of regional economy. Regional Technology database development and analysis.

Research Assistant

9/91 - 3/92

System Engineering Dept., George Mason University, Fairfax, VA.

Application of Tatonnement model for network equilibrium to simulate the traffic congestion problems in Intelligent Vehicle Highway Systems (Fortran and C on a Unix platform (AIX) of IBM 6000).

Summer Internships

The Institute of Public Policy, George Mason University, Fairfax, VA.

5/92 - 8/92

Economic analysis and preparation of report for the Office of Economic Development, Prince William County.

NASA/Goddard Space Flight Center, Greenbelt, MD.

6/91 - 8/91

Development/Implementation of Backprop ANS on MasPar (serial and parallel implementations in C and Parallel C).

Teaching and Research Assistant

Computer Science Dept, George Mason University, Fairfax, VA.

3/91 - 5/91

Assisted faculty in Artificial Intelligence course work at graduate and undergraduate level in lab and coursework.

ISSE Dept, George Mason University, Fairfax, VA.

3/91 - 3/91

To research and develop techniques for concurrency control and recovery in DDBMS.

Computer Engineer

8/79 - 8/90

Computer Maintenance Corporation Ltd. Bombay, India.

Responsibilities include countrywide support of hardware and software for CDC/IBM/ECIL. Supervised and trained Junior Engineers for Hardware maintenance services. Provided customer support courses.

Education

M.S. Computer Science, George Mason University, Fairfax, VA

May 1994

B. S. Engineering, Karnataka Regional Engg. College, India

July 1979

Grant Award, Selected Publications, Working and Conference Papers related to Transportation and Complexity

Grant Award

Recipient of the NSF Grant # ECS0085981 for the study of Road Transportation as Complex Adaptive System: An Exploratory Conceptual Framework to study Road Traffic Patterns, Accessibility, Mobility, Connectivity and Congestion/Emission, 2000. (PI: R.G. Kulkarni, CoPI: R.R. Stough and K.E. Haynes).

Publications

R.G. Kulkarni, L. A. Schintler, R.R. Stough, K. Button (2002). A Kohonen Self-Organizing Map Approach to Modeling Growth Pole Dynamics. *Networks and Spatial Economis*, Vol. 2, pp. 175-189.

R.G. Kulkarni, R.R. Stough, K.E. Haynes (2000a). A Formal Language of Urban Freeway Traffic Patterns. Proceedings of JCIS, Atlantic City, NJ. Vol. 1. pp. 711-717.

R.G. Kulkarni, R.R. Stough, K.E. Haynes (2000b). Towards a Percolation model of Accessibility, *Computers, Environment and Urban Systems*, Vol. 24, pp. 421-434.

R.G. Kulkarni, R.R. Stough, K.E. Haynes (2000c). Towards modeling of Communities of Practice (CoPs): A Hebbian learning approach to Organizational learning. *Technological Forecasting and Social Change*. Vol. 64, pp. 71-83.

R.G. Kulkarni, R.R. Stough, K.E. Haynes (1996). Spin Glass and the Interactions of Congestion and Emissions: An exploratory step, *Transp. Res. C*, Vol. 4, No. 6, pp. 407-476.

L.A. Schintler, R.G. Kulkarni (2000). The Emergence of Small World phenomenon in Urban Transportation Networks: An Exploratory Analysis, in *Spatial Economic Science: New Frontiers in Theory and Methodology*, Ed. Dr. A. Reggiani, pp. 419-434, Springer Verlag, Heidelberg, Germany.

K.E. Button, R.G. Kulkarni, R.R. Stough (2001) Clustering of Transportation Logistic Centers in Urban Areas, in *City Logistics*, Okinawa, Japan, Vol. II, pp. 215-230.

J.H.P. Paelinck, R.G.Kulkarni, Location Allocation Aspects of Tinbergen-Bos Systems, *The Annals of Regional Science*, Vol. 33:pp. 573-580, 1999.

Working Papers

R.G. Kulkarni, R.R. Stough, (1999). A fractal model of Connectivity in regional road networks. Center for Transport Policy and Logistics, George Mason University . Working Paper Series # 99-02

R.G. Kulkarni, R.R. Stough, K.E. Haynes, JHP Paelinck (1999) Emergence of Population Center: An evolutionary approach. Center for Transport Policy and Logistics, George Mason University Working Paper Series #99-22.

R.G. Kulkarni, RR. Stough, K.E. Haynes (1998) Toward Transportation Biology of Traffic Flow Landscape. School of Public Policy, Working Paper Series # 98:3 (<http://policy.gmu.edu>)

Conference Papers

R.G. Kulkarni, R.R. Stough, K.E. Haynes, L.A. Schintler (March 2002). An Exploratory Analysis of Freeway Traffic Control: A Boolean Network Approach A paper presented in the Special Session on Geographical Perspectives on Complexity Theory and Complex systems III at the 98th Annual meeting of the AAG Conference, LA., March 2002.

R.G Kulkarni, R.R. Stough, K.E. Haynes (2000). A model of Knowledge Management in Organizations as Communities of Practice (CoPs): A Neural Network Approach., paper presented at the International Conference on Technology Policy and Innovation, Austin, TX, August 30-September 2, 1999.

T. Friesz, R. R. Stough, R.G Kulkarni, T. Ganzalizadeh (1992). Tatonment model for Network Equilibrium in IVHS (Intelligent Vehicle Highway System) paper presented in Simulation & Modeling Conference at Pittsburgh, 1992.