Christopher V. Rao

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Education

University of California
Lawrence Berkeley National Laboratory Berkeley, CA
Postdoctoral Fellow, March 2000 - present
Advisor: Dr. Adam P. Arkin

University of Wisconsin Madison, WI
Ph.D. in Chemical Engineering, February 2000
Thesis: *Moving Horizon Strategies for the Constrained Process Monitoring and Control of Nonlinear Discrete-Time Systems*
Advisor: Dr. James B. Rawlings

Carnegie Mellon University Pittsburgh, PA
B.S. in Chemical Engineering, May 1994

Research Interests:

Computational and Systems Biology; Bacterial Pathogenesis; Chemotaxis and Motility; Synthetic Genetic Circuits and Signal Transduction Pathways.

Experience

California Institute of Technology Pasadena, CA
Visiting Scientist January, 2003 - June, 2003

Howard Hughes Medical Institute Berkeley, CA
Research Associate March, 2001 - present

Cold Spring Harbor Laboratory Cold Spring Harbor, NY
Advanced Bacterial Genetics Course June, 2002

University of California Berkeley, CA
Postdoctoral Fellow March, 2000 - February, 2001

University of Wisconsin Madison, WI
Research Assistant June 1995 - February, 2000

University of Texas Austin, TX
Research Assistant August 1994 - May 1995

Eastman Kodak Company — New York, NY
Summer Technical Intern — Summer 1993

Teaching

University of Wisconsin — Madison, WI
Lecturer: Undergraduate Process Control — Spring 1999

Teaching Assistant: Undergraduate Process Control Lab — Fall 1995, 1996

Honors

Wright Memorial Fellowship	1994-1995
Best Paper of Session	1997 American Control Conference
Best Paper of Session	1999 American Control Conference

Publications

[1] Christopher V. Rao, John C. Campbell, James B. Rawlings, and Stephen J. Wright. Efficient implementation of model predictive control for sheet and film forming processes. In *Proceedings of American Control Conference, Albuquerque, NM*, pages 2940–2944, 1997.

[2] Christopher V. Rao, Stephen J. Wright, and James B. Rawlings. On the application of interior point methods to model predictive control. *J. Optim. Theory Appl.*, 99:723–757, 1998.

[3] Christopher V. Rao and James B. Rawlings. Optimization strategies for linear model predictive control. In *Proceedings of the 1998 IFAC DYCOPS Symposium, Corfu, Greece*, pages 41–46, 1998.

[4] Christopher V. Rao, James B. Rawlings, and Jay H. Lee. Stability of constrained linear moving horizon estimation. In *Proceedings of American Control Conference, San Diego, CA*, pages 3387–3391, 1999.

[5] Christopher V. Rao and James B. Rawlings. Steady states and constraints in model predictive control. *AIChE J.*, pages 1266–1278, 1999.

[6] Christopher V. Rao and James B. Rawlings. Linear programming and model predictive control. *J. Proc. Cont.*, 10:283–289, 2000.

[7] Christopher V. Rao and James B. Rawlings. Nonlinear moving horizon estimation. In F. Allgöwer and A. Zheng, editors, *Nonlinear Model Predictive Control*, pages 45–69. Birkhäuser, 2000.

[8] David Q. Mayne, James B. Rawlings, Christopher V. Rao, and Pierre O. M. Scokaert. Constrained model predictive control: Stability and optimality. *Automatica*, 36:789–814, 2000.

[9] Christopher V. Rao, James B. Rawlings, and Jay H. Lee. Constrained linear state estimation - a moving horizon approach. *Automatica*, 37:1619–1628, 2001.

[10] Christopher V. Rao and Adam P. Arkin. Control motifs for intracellular regulatory networks. *Annual Reviews of Biomedical Engineering*, 3:391–419, 2001.

[11] Christopher V. Rao and James B. Rawlings. Constrained process monitoring: A moving horizon approach. *AIChE J.*, pages 97–109, 2002.

[12] Christopher V. Rao, Denise M. Wolf, and Adam P. Arkin. Control, exploitation, and tolerance of intracellular noise. *Nature*, 420:231–237, 2002.

[13] Christopher V. Rao and Adam P. Arkin. Stochastic chemical kinetics and the quasi steady-state assumption: application to the Gillespie algorithm. *J. Chem. Physics*, 118:4999–5010, 2003.

[14] Christopher V. Rao, James B. Rawlings, and David Q. Mayne. Constrained state estimation for nonlinear discrete-time systems: Stability and moving horizon approximations. *IEEE Transactions on Automatic Control*, 48:246–258, 2003.

[15] Christopher V. Rao, John R. Kirby, and Adam P. Arkin. Design and diversity in bacterial chemotaxis: A comparative study of Escherichia coli and Bacillus subtilis. *PLoS Biology*, 2:239–252, 2004.

[16] Christopher V. Rao, Michael Frenklach, and Adam P. Arkin. An allosteric model for transmembrane signaling in bacterial chemotaxis. Submitted, 2003.

[17] Christopher V. Rao, Herbert M. Sauro, and Adam P. Arkin. Putting the "control" in metabolic control analysis. Accepted for publications in DYCOPS, 2004.

[18] Christopher V. Rao, John R. Kirby, and Adam P. Arkin. Phosphatase localization ensures uniform signaling in bacterial chemotaxis. In preparation, 2003.

[19] Christopher V. Rao, Phillip Aldridge, Kelly T. Hughes, and Adam P. Arkin. Regulation of sequential flagellar assembly. In preparation, 2003.