

## Enrique Campos-Náñez

- Education**
- UNIVERSITY OF VIRGINIA, MAY 2003  
Ph.D. in Systems and Information Engineering. Charlottesville, VA.  
Advisor: Prof. Stephen D. Patek.  
Dissertation Title: *Adaptive Online Optimization of Markov Reward Processes with Application to Pricing of Multiclass Loss Network Services.*
- STANFORD UNIVERSITY, JANUARY 1996  
M.Sc. in Operations Research. Palo Alto, CA  
Advisor: Prof. Walter Murray.
- UNIVERSIDAD NACIONAL AUTÓNOMA DE MÉXICO, DECEMBER, 1990  
B.Sc. in Mathematics. Emphasis: Applied Mathematics / Operations Research. México, D.F.
- Relevant Experience**
- DEPT. OF ENGINEERING MANAGEMENT AND SYSTEMS ENGINEERING  
THE GEORGE WASHINGTON UNIVERSITY, JULY 2003- Washington, D.C.  
*Assistant Professor*
- Lecture on Operations Research (deterministic and stochastic models), Systems Engineering, Game Theory, Probability/Statistics, System Dynamics and Dynamic Programming.
- DEPT. OF SYSTEMS ENGINEERING  
UNIVERSITY OF VIRGINIA, JUNE-AUGUST 2003  
*Research Scientist* Charlottesville, VA
- Modeling and analysis of Virginia's electricity power market.
  - Computation of equilibrium electricity prices under market competition.
- DEPT. OF SYSTEMS ENGINEERING  
UNIVERSITY OF VIRGINIA, 1999-2003  
*Research Assistant* Charlottesville, VA
- Characterization of optimal pricing schemes for network services, and design of on-line algorithms for their computation.
  - Analysis of the convergence of simulation-based optimization techniques.
- ITESM-CAMPUS QUERÉTARO, 1997-1999  
*Full-Time Professor, Department of Industrial and Systems Engineering* Querétaro, México
- Taught courses on inventory control, systems dynamics, decision analysis, and operations research. Consultant to local government and industry on application of decision analysis methods, simulation of business processes, and development of GIS tools for the state government.
- APRENDIZAJE SISTÉMICO, 1996-1998  
*Development Manager* Saltillo, México
- Design of simulation methodology and services for the company, including the development of commercial simulation applications. In charge of simulation consulting services in business and manufacturing process simulation.
  - Design and implementation of *Jerarca*, an implementation of multicriteria decision analysis techniques (AHP).
- TECNOLOGÍAS INTERACTIVAS, 1990-1994  
*Founder and CEO* Tecnologías Interactivas (Interactive Technologies), a startup to disseminate the use of simulation technologies and multimedia for learning. Querétaro, México

**Journal  
Publications**

1. Z. Yaniv, P. Cheng, E. Wilson, T. Popa, D. Lindisch, E. Campos-Náñez, H. Abeledo, V. Watson, F. Banovac, K. Cleary, “Needle-based Interventions with the Image Guided Surgery Toolkit (IGSTK): From Phantoms to Clinical Trials”, *forthcoming* IEEE Transactions on Biomedical Engineering.
2. E. Campos-Náñez, “Decentralized Algorithms for Online Pricing in Multiclass Loss Networks”, *forthcoming* IEEE/ACM Transactions on Networking.
3. F. Banovac, P. Cheng, E. Campos-Náñez, B. Kallakury, T. Popa, E. Wilson, K. Cleary, “Radiofrequency Ablation of Lung Tumors in Swine Assisted by a Navigation Device with Pre-procedural Volumetric Planning”, *forthcoming* Journal of Vascular and Interventional Radiology.
4. E. Campos-Náñez, A. Garcia, and C. Li, “A Game Theoretic Approach to Efficient Power Management in Sensor Networks”, *Operations Research*, Vol. 56, No. 3, May-June, 2008.
5. E. Campos-Náñez, A. Garcia, and N. Fabra, “Dynamic Auctions for On-Demand Services”, *IEEE Transactions on Systems, Man, and Cybernetics: Part A*, Vol. 37, No. 6, November, 2007.
6. A. Garcia, Campos-Náñez, E. and J. Reitzes, “Dynamic Pricing and Learning in Electricity Markets”, *Operations Research*, Vol. 53, No. 2, 2005.
7. E. Campos-Náñez and S. D. Patek, “Dynamically Identifying Regenerative Cycles in Simulation-Based Optimization Algorithms for Markov Chains”, *IEEE Transactions on Automatic Control*, Vol. 49, No. 6, pp. 1022-1025, 2004.

**Book  
Chapters**

8. C. Lopez, E., G. Mancinas, I. Palacios R., and E. Campos-Náñez, “Modelaje Jerárquico en la Satisfacción del Cliente” (Hierarchic Modeling of Client Satisfaction), Chapter 11 of *Evaluación y Decisión Multicriterio* (Multicriteria Decision and Evaluation), E. Martinez and M. Escudey, Editors, UNESCO-Editorial Universidad de Santiago, 1998.

**Refereed  
Conference  
Papers**

9. E. Campos-Náñez, “Simulation-based Optimization of Markov Reward Processes with Unknown Parameters”, Proceedings of the European Conference on Modeling and Simulation, Madrid, Spain, 2009.
10. F. Banovac, P. Cheng, E. Campos-Náñez, B. Kallakury, T. Popa, H. G. Abeledo, D.J. Lindish, M. Mantell, K. Cleary, “Radiofrequency Ablation of Lung Tumors in Swine Assisted by a Navigation Device with Pre-procedural Volumetric Planning”, *Journal of Vascular and Interventional Radiology*, Vol. 20, Issue 2, Page S98, February 2009.
11. S. Sahin, K. Narayanaswamy, and E. Campos-Náñez, “Call Setup Performance Improvements over Mobile Satellite Systems Using IP Multimedia System”. *Proceedings of the IEEE International Workshop on Satellite and Space Communications (IWSSC)*, pp. 321-325, 2008.
12. E. Campos-Náñez, E. C. Lopez and H. Teissier-Fuentes, “A Field for Learning about the Climate-Energetic Transition: Concepts and Structure”. Proceedings of the 26th International Conference of the System Dynamics Society, Athens, Greece, 2008 (ISBN 978-1-935056-01-0).
13. E. Campos-Náñez, “Distributed Online Optimization of Markov Reward Processes”, *Proceedings of the 46th IEEE Conference on Decision and Control*, ISBN: 1-4244-1498-9, pp. 6166-6171, 2007.
14. M. McCutchan and E. Campos-Náñez, “The effect of Network Topology in Diffusion Processes”, *Proceedings of the 25th International Conference of the System Dynamics Society*, Boston, MA, 2007 (ISBN 978-0-9745329-8-1).

15. F. Banovac, H. Abeledo, E. Campos-Náñez, B. J. Wood, T. Popa, P. Cheng, K. Cleary, "An Image-Guided System for Optimized Volumetric Treatment Planning and Execution for Radiofrequency Ablation of Liver Tumors", *International Journal of Computer Assisted Radiology and Surgery*, Vol. 2, Suppl. 1, pp. 146-151, 2007.
16. H. Zhang, F. Banovac, S. S. Munuo, E. Campos-Náñez, H. Abeledo, K. R. Cleary, "Treatment Planning and Image Guidance for Radiofrequency Ablation of Liver Tumors," *Medical Imaging 2007: Visualization and Image-Guided Procedures. Proceedings of SPIE*, Vol. 6509, pp. 650922, 2007.
17. J. Sekine, E. Campos-Náñez, J. Harrald, and H. Abeledo, "A Simulation-Based Approach to Trade-off Analysis for Supply-Chain Security", *Proceedings of the Winter Simulation Conference*, pp. 521-528, 2006.
18. A. Garcia, Campos-Náñez, E. and C. Li, "Distributed On-line Bayesian Search", *Proceedings of StoDiS 2005 - Workshop on Stochasticity in Distributed Systems/IEEE CollaborateCom*, pp. 5, 2005.
19. E. Campos-Náñez and S. D. Patek, "Adaptive Online Optimization of Markov Reward Processes", *Proceedings of the IEEE Joint 44th Conference on Decision and Control and European Control Conference*, pp. 8034- 8041, 2005.
20. E. Campos-Náñez and S. D. Patek, "On-line Pricing of Network Resources", *Proceedings of INFOCOM*, Vol. 2, pp. 1231- 1241, 2003.
21. E. Campos-Náñez and S. D. Patek, "On Improving the Performance of Simulation-Based Optimization Methods for Average Reward Problems", *Proceedings of the Winter Simulation Conference*, Vol. 2, pp. 1306-1314, 2001.
22. S. D. Patek, and E. Campos-Náñez, "Pricing Dialup-Services on the Internet: An Example of Congestion-Dependent Pricing", *Proceedings of the 39th IEEE Conference on Decision and Control*, Vol. 3, pp. 2296-2301, 2000.
23. E. C. Lopez, E. Campos-Náñez, and G. Siade-Barquet, "Using a System Dynamics Model for Dissemination of Technological Policies Among Industry", *Proceedings of The International System Dynamics Conference*, Boston, 1996.
24. E. Campos-Náñez, A. Garcia, and C. Li, "SIE-06006: A Game Theoretic Approach to Efficient Power Management in Sensor Networks", Department of Systems and Information Engineering, University of Virginia, 2006.
25. A. Garcia, E. Campos-Náñez, and C. Li, "SIE-05003: Distributed On-line Bayesian Search", Department of Systems and Information Engineering, University of Virginia, 2005.
26. E. Campos-Náñez, N. Fabra, and A. Garcia, "SIE-04001: Dynamic Auctions for On-Demand Services", Department of Systems and Information Engineering, University of Virginia, 2004.
27. E. Campos-Náñez, and S. D. Patek, "SIE-020003: Dynamically Identifying Regenerative Cycles in Simulation-Based Optimization Algorithms for Markov Chains", technical report, Department of Systems and Information Engineering, University of Virginia, 2002.
28. E. Campos-Náñez, and S. D. Patek, "SIE-020004: On-line Tuning of Prices for Network Services", technical report, Department of Systems and Information Engineering, University of Virginia, 2002.
29. A. Garcia, E. Campos-Náñez, and J. Reitzes, "SIE-020005: Dynamic Pricing & Learning in Electricity Markets", technical report, Department of Systems and Information Engineering, University of Virginia, 2002.

**Technical  
Reports &  
Others**

30. S. Medellin Morales, E. Campos Lopez, E. Campos-Náñez, A. Gonzalez, and V. Camara-Gonzalez, “Meliponicultura Maya: Perspectivas Para Su Sostenibilidad” (in spanish). Technical Report No. 2, Sostenibilidad Maya, University of California, Riverside, 1991.

#### Submitted

31. E. Campos-Náñez, and T. P. Filomena, “Duopoly Competition in Electricity Markets under Emission Caps”, submitted to Energy Economics.
32. E. Campos-Náñez, “Distributed Algorithms for the Optimization of Markov Reward Processes”, submitted to Optimal Control Applications and Methods.
33. J. Sekine, E. Campos-Náñez, J. Harrald, and H. Abeledo, “A Simulation-Based Approach to Trade-off Analysis for Supply-Chain Security”, submitted to the International Journal of Production Economics.
34. T. P. Filomena, M. J. Anzanello, F. J. Kliemann, M. R. Duffey, and E. Campos-Náñez, “Manufacturing Feature-Based Cost Management System”, submitted to Production Planning and Control.
35. E. Campos-Náñez, “Algorithms for Identification and Control of Markov Reward Processes”, submitted to Optimal Control Applications and Methods.
36. T. P. Filomena, E. Campos-Náñez, and M. P. Duffey, “Cournot-Nash Equilibrium for Technology and Capacity Investment in Electricity Markets with Uncertain Emission Costs”, submitted to Operations Research.

#### Working Papers

37. E. Campos-Náñez and K. Jeeves, “Dynamic Pricing of Electricity under Cap and Trade”, working paper.
38. E. Campos-Náñez, H. Abeledo, F. Banovac, K. Cleary, “Optimal Treatment Planning for Radiofrequency Ablation of the Liver”.

#### Conferences and Talks

1. “Approximate Dynamic Programming Techniques”, ITESM Campus Toluca, Toluca, México, July, 2009. Invited workshop.
2. “Applications and Perspectives in Mathematical Optimization”, ITESM Campus Querétaro, Querétaro, México, July, 2009. Invited talk.
3. “Technology Portfolio and Capacity Investments under Emissions Cost Uncertainty”, CORS / INFORMS International Meeting, Toronto, Ontario, 2009.
4. “Price Formation and Reliability of Supply under a Cap & Trade System”, CORS / INFORMS International Meeting, Toronto, Ontario, 2009.
5. “Game Theoretic Approaches to Large-Scale Coordination”, CORS / INFORMS International Meeting, Toronto, Ontario, 2009.
6. “Simulation-based Optimization of Markov Reward Processes with Unknown Parameters”, European Conference on Modeling and Simulation, Madrid, Spain, 2009.
7. “GHG Emission Regulation in the Electrical Sector: Perspectives and Modeling”, II International Workshop *Building a Sustainable World: The Climate Change Challenge*, Mexico City, April, 2009. Invited talk.
8. “Treatment Planning for Radiofrequency Ablation of Liver Tumors”, INFORMS Annual Meeting, Washington, DC, 2008.
9. “Investment Dynamics Under a Cap & Trade Regime”, INFORMS Annual Meeting, Washington, DC, 2008.
10. “A Field for Learning about the Climate-Energetic Transition: Concepts and Structure”, 26th International Conference of the System Dynamics Society, Athens, Greece 2008.

11. “Distributed Online Optimization of Markov Reward Processes”, 46th IEEE Conference on Decision and Control, New Orleans, USA, 2007.
12. “Distributed Online Optimization of Markov Reward Processes”, INFORMS Annual Meeting, Seattle, USA, 2007.
13. “The Effect of Network Topology in Diffusion Processes”, 25th International Conference of the System Dynamics Society, Boston, MA, 2007.
14. “A Simulation-based Approach to Trade-off Analysis for Supply-Chain Security”, Winter Simulation Conference, Monterey, California, December 3-6, 2006.
15. “Trade-off Analysis for Port Security”, *Risk Analysis Symposium 2006*, Los Alamos National Labs, New Mexico, May 20, 2006.
16. “Distributed On-line Bayesian Search”, StoDiS 2005 - Workshop on Stochasticity in Distributed Systems/IEEE CollaborateCom, San Jose, California, 2005.
17. “Adaptive Online Optimization of Markov Reward Processes”, IEEE Joint 44th Conference on Decision and Control and European Control Conference, Seville, Spain, 2005.
18. “A Decentralized Algorithm for Coverage in Sensor Networks”, invited presentation, University of Virginia, November 4th, 2005.
19. “Adaptive Pricing of Network Services”, Ninth INFORMS Computing Society Conference, Annapolis, MD, January 5-7, 2005.
20. “Online Pricing of Network Services”, invited presentation, Seventh INFORMS Telecommunications Conference in Boca Raton, Florida.
21. “Learning in Electricity Markets”, invited presentation, INFORMS Conference, Atlanta, Georgia, 2003.
22. “Pricing of Network Services”, invited presentation, George Washington University, Washington, D.C., 2003.
23. “Online Tuning of Prices for Network Services”, presented at *IEEE INFOCOM 2003*, San Francisco, CA, 2003.
24. “Adaptive Optimization of Markov Reward Processes”, Systems Seminar, Department of Systems and Information Engineering, University of Virginia, Charlottesville, VA, 2003.
25. “Pricing of Network Services”, invited presentation, Lehigh University, Bethlehem, PA, 2003.
26. “Dynamic Pricing and Learning in Electricity Markets”, presented at the *International Symposium of Dynamic Games*, St. Petersburg, Russia, 2002.
27. “Dynamic Pricing and Learning in Electricity Markets”, L’Institut d’Economie Industrielle, Wholesale Markets for Electricity”, Toulouse, November 22-23, 2002.
28. “Pricing Network Services for Congestion-Controlled Flows”, presented at the *2001 International Symposium on Adaptive and Intelligent Systems and Control*, University of Virginia, Charlottesville, VA, 2001.
29. “On Improving the Performance of Simulation-Based Optimization Methods for Average Reward Problems”, *Winter Simulation Conference*, Arlington, VA, 2001.
30. “Pricing Dialup-Services on the Internet: An Example of Congestion-Dependent Pricing”, *IEEE Conference on Decision and Control*, Sydney, Australia, 2000.

#### Sponsored Research

- NIH-NA-MIC (subcontract to Georgetown University) Grant for “Open Source Implementation of a Treatment Planning System for Radiofrequency Ablation of Liver Tumors,” (PI, ~ 110K).
- NIH-NA-MIC (subcontract to Georgetown University) Grant for “Treatment Planning

Optimization for Radiofrequency Ablation of Liver Tumors,” (Co-PI, ~ 27K).

- Awarded with the Institute of Biomedical Engineering (GWU) Interdisciplinary Research Fund for 2006 for the proposal “Optimization of Treatment Planning in Radiofrequency Ablation of Liver Cancer Tumors” (2006) (~15K).
- RFF for “Supply Reliability, Price, and Technology Mix in Electricity Markets under an Emission Allowances Trading System”, (2007) (~6K).

#### **Honors & Awards**

- Professor of the Year Award (EMSE Department), School of Engineering and Applied Science, The George Washington University (2006).
- Elected Faculty Member of Omega Rho, the Honor Society of the Institute for Operations Research and Management Science (INFORMS), (2005).
- Louis T. Rader Outstanding Ph.D. Student Award, awarded by the Department of Systems and Information Engineering, University of Virginia, Charlottesville (2003).
- Awarded an INFOCOM 2003 Travel Grant to present published papers.
- Awarded CONACYT Scholarship for both Masters (1994) and Doctoral studies (2000).
- Nominated by the Students of the Department of Industrial and Systems Engineering for the Best Campus Professor Award, ITESM Campus Querétaro, Mexico, May, 1999.

#### **Professional Affiliations**

- Member of the Institute for Operations Research and Management Sciences (INFORMS).
- System Dynamics Society.

#### **Completed Ph.D. Dissertations**

- “Trade-off Analysis in Supply Chain Security”  
Student: Junko Sekine.  
Defended: Fall, 2006.
- “The Arabian Stock Market Bubble and Its Determinants”  
Student: Abdullah Hafiz.  
Defended: 2007.

#### **Professional Activities**

- Editorial Board of Open Automation and Control Systems Journal.
- Track organizer on “Distributed Optimization” and “Meta-Heuristics”, Latin-Ibero American Conference on Operations Research (CLAIO), 2008.
- Session chair: Workshop on Stochastic Distributed Systems, StoDIS 2005.
- Session chair: INFORMS Annual Meeting, 2008.
- Reviewer for: IEEE/ACM Transactions on Automatic Control, Automatica, IEEE/ACM Transactions on Networking, Risk Analysis: An International Journal, IEEE Transactions on Systems, Man and Cybernetics: Part A, SIAM Journal on Control and Optimization, Canadian Journal of Economics, Wireless Communications and Mobile Computing, European Journal of Operations Research, Journal of Homeland Security and Emergency Management, IEEE INFOCOM, IEEE/ASC Conference on Decision and Control, Winter Simulation Conference.