2nd International Conference on Computational Sustainability

June 28–30, 2010 MIT, Cambridge, MA, USA

www.computational-sustainability.org/compsust10



Conference Program

Monday, June 28

	Room 32-123
9:00-9:10	Brian Williams
	Welcome to Computational Sustainability
	Earth Ecosystem and Computational Modeling
	Session Chair Youssef Marzouk
9:10-9:40	Susan Avery
	Charting the Future Through an Ocean of Data
9:40-10:10	Carl Wunsch
	Methodological Requirements for Estimating Climate Change
10:10-10:40	Anna Michalak
	Towards a Global Carbon Monitoring System: Assimilating Environmental Data in a
10.10 11.00	Geostatistical Framework
10.40-11.00	
11:00-11:20	Yousset Marzouk
	Statistical Interence for Physical Models of Energy Systems
	Conservation Modeling
44 00 44 40	
11:20-11:40	Graeme R. Newell
44-40-40-00	
11:40-12:00	Steven Phillips Computation for Conservation Biology
12:00 1:20	
12:00-1:30	
	The Smart Grid
1:30-2:00	George Arnold
	New Paradigms for the Electric Power System
	Challenges in Achieving Sustainabiliy
	Session Chair Mardavij Roozbenani
2:00-2:30	Janusz Bialek
	Mathematical and Computational Challenges in Modelling of Future Energy Systems
2:30-3:00	Marija Ilic Madian an the Dight Decklamy Kouste Drigging Value to the Oustainship Fragmy Future
	working on the Right Problem: Key to Bringing value to the Sustainable Energy Future
	Synthesis for Renewable Energy
3:00-3:30	Pam Silver
	Designing Sustainability

3:30-4:00	Break
	Information Gathering and Sensing Session Chair Paul Robertson
4:00-4:20	David Hill Real-Time Environmental Sensors for Sustainable Management: Challenges and Opportunities
4:20-4:40	John Fisher Information Gathering Under Resource Contraints: Greed is Good
	Transportation Session Chair Eric Feron
4:40-5:00	Hamsa Balakrishnan Reducing Fuel Burn and Emissions through Optimized Airport Operations
5:00-5:20	Eric Feron Optimal Control for a Sustainable Air Transportation Infrastructure
5:30-7:30	Poster Session

Tuesday, June 29

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	Room 32-123		
	Markets and Multi-agent Systems		
	Panel Chair David Parkes		
9:00-9:20	David Parkes		
	Promoting Sustainability: Exploring t	the Role of Expressive, Indirect, and	
	Hidden Markets		
9:20-9:40	Keith Decker, Sachin Kamboj		
	V2G: Electric Vehicle Coalitions for V	Vehicle-To-Grid Power Regulation	
9:40-10:00	Sarvapali D. Ramchurn		
	Multi-Agent Systems for the Smart C	Grid	
10:00-10:20	Jeff Kephart		
	A Multi-Agent Systems Perspective	on Data Center Energy Management	
10:20-10:30	Discussion		
10:30-11:00	Break		
11:00-12:00	Competitions as a Tool for		
	Focusing Innovation Panel		
	Session Chair Erika Wagner		
Panelists	Francis Beland, XPrize		
	Robynn Sturm, White House Office		
	of Science & Technology Policy		
	Norman Whitaker, Darpa		
12:00-1:30	Lunch		
	Track 1 Room 32-123	Track 2 Room 32-141	Track 3 Room 32-155
	Ecology and Species Distribution	Electric Markets and Power	Optimization; Multiple Objectives
	Modeling	System Modeling	Session Chair Martin
	Session Chair Steven Phillips	Session Chair Mardavij Roozbehani	Sachenbacher
1:30-1:50	Neo Martinez	Audun Botterud	Anika Schumann
	Eco-cubed: Ecology and Economy	Wind Power Forecasting in	Preference Reasoning for Optimal
	of Complex Ecosystems	Electricity Markets	Building Operation
1:50-2:10	Steve Kelling	Marija Ilic	Kent Messer and Jacob Fooks
	A Data Intensive Science Approach	A Smart Grid Simulator: Illustration	The Application of Multiple
	to Research in Biodiversity	on a Small IEEE System	Objective Linear Programming to
2:10-2:30	Rebecca Hutchinson	Janusz Bialek	Hernan Aguirre
	Combining Boosted Regression	Security of Supply and Wind	Evolutionary Many-objective
	Occupancy Models		Optimization for Sustainability
2.30-2.50	Weng Keen Wong	Matias Alejandro Negrete-Pincetic	Bistra Dilking and Javant
2.30-2.30	Modeling Experts and Novices in	The Value of Volatile Resources in	Kalagnanam Ontimal Layout of
	Citizen Science Data	Electricity Markets	Wind Farms
2.20-3.10	Daniel Fink	Mardavii Roozbehani	Eshel Gidon
2.00 0.10	Spatio-Temporal Exploratory	Stability of Electricity markets under	Environmental Optimization of
	Models of Bird Habitat and	Real-time Pricing	Human Diets: Application of Linear
	Migration		Programming to Food Choices and
			the US Farm Bill
3:10-3:20	Discussion	Discussion	Discussion

3:20-3:40	Break		
	Track 1 Room 32-123	Track 2 Room 32-141	Track 3 Room 32-155
	Natural Resource Management I Session Chair Shlomo Zilberstein	Smart Grid and Optimization Session Chair Andreas Hofmann	Collaboration, Deliberation, and Communication Session Chair Josh Introne
3:40-4:00	Shlomo Zilberstein Resource Management Using Approximate Dynamic Programming	David Waltz Computation's Role in Building the Smart Grid for a Sustainable Future	César A. Hidalgo Complexity and The Sustainability of Economic Development
4:00-4:20	Stefano Emmon Playing Games Against Nature: Optimal Policies for Renewable Resource Allocation	Masahiro Ono Market-Based Stochastic Optimization for Distributed Energy Management	Josh Introne Connecting Climate Models in the Climate Collaboratorium
4:20-4:40	Terry Freisz Modeling and Computing Sustainable Resource Exploitation in Dynamic Games with Application to Whaling	Warren Powell Stochastic Optimization and Optimal Learning in Energy Systems.	Mark Klein The MIT Deliberatorium: An Online Argumentation Tool for Enabling Large-Scale Deliberation About Complex Systemic Problems
4:40-5:00	Steven Barrett Air Quality Impacts of Aviation	Maria Fox Automated Prediction for Infrastructure Planning	Matthew Hockenberry Transparency in Sustainability: Communicating Impact on the Sourcemap Web Platform
5:00-5:10	Discussion	Discussion	Discussion
5:10-5:20	Passing Time	Passing Time	Passing Time
	Social Computing Session Chair Carla Gomes		
5:20-5:40	Eric Horvitz People, Quakes, and Communications: Inferences about a Seismic Event and its Influences on a Population from Call Data	-	
5:40-6:10	Tom Malone The Climate Collaboratorium: Harnessing Collective Intelligence to Address Global Climate Change	-	

Wednesday, June 30

Energy Efficient Computation Panel Chair Avrind 9:00-9:20 Avrind 0:01-9:20 Avrind 2:02-9:20 Avrind 9:20-9:20 Avrind 0:20:20 Avrind 9:20:9:20 Avrind 9:20:9:20 Avrind 9:20:9:20 Avrind 9:20:9:20 Avrind 9:20:9:20 Avrind 9:20:9:20 Avrind Consumption with Code Perforation 9:40:10:00 Yuraj Agarval 10:20:11:20 Break 10:20:11:20 Break 10:20:11:20 Break Adaptive Sampling and Autonomous Science Panel Chair Avrino Haomi Leonard Autonomy and Adaptive Sampling: Cooperative Control for Mobile Sensor Networks 11:20:11:30 Carlos Caicced and Naomi Leonard Autonomy and Adaptive Sampling: Cooperative Control for Mubile Sensor Networks 11:20:11:30 Linech Track 1 Room 32:123 Track 2 Room 32:141 Track 1 Room 32:123 Track 2 Room 32:141 Track 3 Room 32:155 Connected Sustainable Momagement Margement 18 Session Chair Garla Gomes Development Session Chai		Room 32-123				
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Track 1 Room 32-123 Track 2 Room 32-141 Track 3 Room 32-155 Natural Resource Management II & Development Session Chair Carla Gomes Power Systems Management Session Chair Maria Fox Connected Sustainable Homes and Cities 1:30-1:50 Nathan Eagle Big Data, Global Development, and Complex Social Systems 1:30-1:50 Helmut Simonis Constraint-Based Scheduling for Reducing Peak Electricity 1:30-1:50 Sotirios Kotsopoulos 1:50-2:10 Auroop Ganguly Water Resources with Climate Change and Growing Population 1:50-2:10 Yous Chen An Advanced Framework for Enabling Electricity Infrastructure Real-Time Decision Support 1:50-2:20 Juhong Park Simulation Studies for Connected Sustainable Home 2:10-2:30 Dan Sheldon Optimal Network Design for the Spread of Cascades 2:10-2:30 Ning Zhou A State Prediction Methodology for Electric Power Grid Operation 2:20-2:35 Dimitris Papanikolaou Mobility on Demand Mobility on Demand Mobility on Demand 2:30-2:50 Steven Goldsmith Large Scale Lifecycle Analysis for Global Energy Systems 2:50-3:10 May Orefily A Computational Approach to Wind Energy Efficiency 2:35-2:50 David Quinn Urban Metabolism: Population Patterns 3:10-3:20 Discussion 3:10-3:20 Discussion 2:50-3:05 Corey Ippolito Intelligent Adaptive Control Techniques for NASA's Sustainability Base	12:00-1:30	Lunch				
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2:30-2:50 Steven Goldsmith Large Scale Lifecycle Analysis for Global Energy Systems 2:30-2:50 Martin Sachebacher The Shortest Path Problem Revisited: Optimal Routing for Electric Vehicles 2:20-2:35 Dimitris Papanikolaou Mobility on Demand 2:50-3:10 Gary Johnson Service Path Attribution Networks (SPANs):Spatially Quantifying the Flow of EcosystemServices from Landscapes to People 2:50-3:10 Una May O'Reilly A Computational Approach to Wind Energy Efficiency 2:35-2:50 David Quinn 3:10-3:20 Discussion 3:10-3:20 Discussion 2:50-3:05 Corey Ippolito Intelligent Adaptive Control Techniques for NASA's Sustainability Base	2:10-2:30	Dan Sheldon Optimal Network Design for the Spread of Cascades	2:10-2:30	Ning Zhou A State Prediction Methodology for Electric Power Grid Operation	2:05-2:20	Andreas Hofmann Decision Support for Sustainable Homes
2:50-3:10 Gary Johnson 2:50-3:10 Una May O'Reilly 2:35-2:50 David Quinn Service Path Attribution A Computational Approach to Urban Metabolism: Population Networks (SPANs):Spatially Wind Energy Efficiency Density and Transportation Quantifying the Flow of EcosystemServices from Patterns 1:10-3:20 Discussion 3:10-3:20 Discussion 2:50-3:05 Corey Ippolito 1:10-3:20 Discussion 3:10-3:20 Discussion 2:50-3:05 Sorey Ippolito 1:10-3:20 Discussion 3:10-3:20 Discussion 2:50-3:05 Corey Ippolito 1:10-3:20 Discussion 3:10-3:20 Discussion 2:50-3:05 Corey Ippolito 1:10-3:20 Discussion 3:10-3:20 Discussion 2:50-3:05 Corey Ippolito 1:10-3:20 Discussion 3:10-3:20 Discussion 2:50-3:20 Discussion	2:30-2:50	Steven Goldsmith Large Scale Lifecycle Analysis for Global Energy Systems	2:30-2:50	Martin Sachebacher The Shortest Path Problem Revisited: Optimal Routing for Electric Vehicles	2:20-2:35	Dimitris Papanikolaou Mobility on Demand
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3:20-3:40	Break				
	Observations, Sensors, and Networks Session Chair Youssef Marzouk		CyberSecurity and the Sustainability of Cyberspace Session Chair Shannon Spires		Ocean Observing Systems Session Chair Brian Williams
3:40-4:00	Karsten Steinhaeuser Descriptive Analysis of the Global Climate System and Predictive Modeling for Uncertainty Reduction in Climate Projections using Complex Networks	3:40-4:00	Shannon Spires Smart Grid Cybersecurity Challenges	3:40-3:55	Don Eickstedt Automating Adaptive Sampling in the Ocean
4:00-4:20	Varun Mithal A Global Forest Cover Monitoring System	4:00-4:20	Roger Hurwitz Sustaining Cyberspace: Some Computational Aspects	3:55-4:10	Michael Benjamin and Henrik Schmidt Nested Autonomy for Large Scale Ocean Sensing
4:20-4:40	Edmund W. Schuster Internet Architecture for Bio Productivity	4:20-4:40	John Mallery The Cyber Insecurity Crisis as a Computational Sustainability Conundrum	4:10-4:25	Hui Li Goal-directed Commanding of Underwater Vehicles through Hybrid Planning
4:40-5:00	Constantinos Evangelinos On-Demand Distributed Computing for Real-Time Uncertainty Quantification	4:40-5:00	Discussion	4:25-4:40	Cesar Harada The Open Sailing Initiative
				4.40-2.00	Discussion