Editors:
Prof. Nikos E. Mastorakis, Technical University of Sofia, BULGARIA
Prof. Manoj Jha, University of Baltimore, USA

RECENT ADVANCES IN URBAN PLANNING & TRANSPORTATION

RECENT ADVANCES IN URBAN PLANNING AND TRANSPORTATION

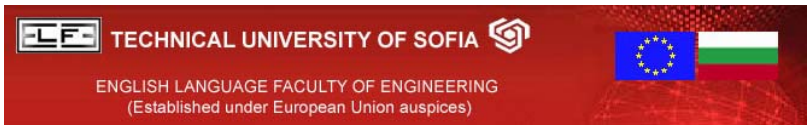
Proceedings of the 2nd WSEAS International Conference on URBAN PLANNING and TRANSPORTATION (UPT '09)

Rodos, Greece, July 22-24, 2009

Mathematics and Computers in Science Engineering
A Series of Reference Books and Textbooks

ISBN: 978-960-474-102-1
ISSN: 1790-2769

Published by WSEAS Press
www.wseas.org



RECENT ADVANCES IN URBAN PLANNING and TRANSPORTATION

Proceedings of the 2nd WSEAS International Conference on URBAN PLANNING and TRANSPORTATION (UPT '09)

Rodos, Greece
July 22-24, 2009

Mathematics and Computers in Science Engineering
A Series of Reference Books and Textbooks

Published by WSEAS Press
www.wseas.org

ISSN: 1790-2769
ISBN: 978-960-474-102-1

RECENT ADVANCES IN URBAN PLANNING and TRANSPORTATION

Proceedings of the 2nd WSEAS International Conference on URBAN PLANNING and TRANSPORTATION (UPT '09)

Rodos, Greece, July 22-24, 2009

Mathematics and Computers in Science Engineering
A Series of Reference Books and Textbooks

Published by WSEAS Press
www.wseas.org

All papers of the present volume were peer reviewed by two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive.
See also: http://www.worldses.org/review/index.html

ISSN: 1790-2769
ISBN: 978-960-474-102-1

World Scientific and Engineering Academy and Society

RECENT ADVANCES IN URBAN PLANNING and TRANSPORTATION

Proceedings of the 2nd WSEAS International Conference on URBAN PLANNING and TRANSPORTATION (UPT '09)

Rodos, Greece
July 22-24, 2009

Preface

This year the 13th WSEAS International Conference on Urban Planning and Transportation (UPT '09) was held in Rodos, Greece, in July 22-24, 2009. The Conference remains faithful to its original idea of providing a platform to discuss urban planning strategy and development, urban planning management, urban planning and environment, social differences and urbanization, environmental protection etc. with participants from all over the world, both from academia and from industry.

Its success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of this conference are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

Table of Contents

Keynote Lecture 1: Embedded Systems Design – Scientific Challenges and Work Directions 11
Joseph Sifakis

Keynote Lecture 2: Quantum Cryptography and Chaos Functions: The Ultimate for Network Security 12
Stamatios Kartalopoulos

Keynote Lecture 3: Content-Adaptive Efficient Resource Allocation for Packet-Based Video Transmission 13
Aggelos K. Katsaggelos

Keynote Lecture 4: Computer Aided-Visual Perception : Challenges and Perspectives 14
Nikos Paragios

Keynote Lecture 5: Control and Estimation Theory: Current Trends, New Challenges, & Directions for the Future 15
Lena Valavani

Plenary lecture 1: Issues and Opportunities in Sustainable Fuel and Vehicle Technologies 16
M. Ehsani

Plenary lecture 2: From Industrial to Postindustrial Landscapes – Brownfield Reuse in Shrinking Cities 18
Thomas Panagopoulos

Plenary lecture 3: The Fuel Temperature Influence on Gas Emissions when used as Fuel Diesel-Olive Seed Oil Blends 19
Charalampos Arapatsakos

Plenary lecture 4: Planning for Metropolitan Regions: The Land-Use & Transportation Connection 20
Ardeshir Anjomani

A Heuristic Procedure to Solve an Evolutionary Vehicle Routing Problem with Time Windows 23
Gaetano Fusco, Maria Pia Valentini, Valentina Conti

The Fuel Temperature Effect on the Gas Emissions when use as Fuel Diesel-Palm + Sunflower Oil Mixture 29
Charalampos Arapatsakos, Dimitrios Christoforidis, Styliani Gkavaki

Behaviour of Gas Emissions on Mixtures of Diesel & Olive Seed Oil in Relation to Different Temperatures 37
Charalampos Arapatsakos, Dimitrios Christoforidis, Anastasios Karkanis

The Attitude of CO, HC, NO and Smoke Emissions on Different Temperatures 45
Charalampos Arapatsakos, Dimitrios Christoforidis, Styliani Gkavaki

From Industrial to Postindustrial Landscapes – Brownfield Regeneration in Shrinking Cities 51
Thomas Panagopoulos

The Carrying Capacity for Touristic Development and the Environmental Capacity about the Sustainability: Research in Certain Coasts of Magnesia, Greece 58
Efstathios Koutseris

The Accessibility of Inland Magnesia Coasts, Greece, in the Sustainable Touristic Planning and Development 64
Efstathios Koutseris

Analyzing Pakistan's Freight Transportation Infrastructure using Porter's Framework and Forecasting Future Freight Demand using Time Series Models 70
Muhammad Abbas Choudhary, Nawar Khan, Muhammad Arshad, Aisha Abbas

Possibilities of Spatial Development of Industry in the Serbia's Cities 78
Slavka Zekovic

V2I based Measurement of Vehicle Speed and Traffic Volume 84
Quoc Chuyen Doan, Tahar Berradia, Joseph Mouzna

Analysis of Operational Urban Cellular Automata Models 91
I. Sante, A. M. Garcia, D. Miranda, R. Crecente

Analysis of Factors Influencing Urban Growth Patterns on Small Towns 99
A. M. Garcia, I. Sante, D. Miranda, R. Crecente

Analysis of the Stochastic Component of Urban Models Based on Cellular Automata 105
A. M. Garcia, I. Sante, D. Miranda, R. Crecente

Designing Departure Facility Layout at Airport Passenger Terminals 111
Jin-Ru Yen, Hsiu-Fen Lin, Chin-Wu Chu

GIS for Calculating Electromagnetic Field 117
Vincenzo Barrile,Giuliana Bilotta, Francesco Di Capua

Assessing Container Terminal Safety and Security Using Data Envelopment Analysis 125
Elisabeth Gundersen, Evangelos I. Kaisar, Panagiotis D. Scarlatos

Sustainability of the Urban Planning of the Fortress (Cetate) Neighborhood from Timisoara - Past, Present and Future 131
Valentin Capotescu

Are We Heading Towards Accessible Environments? 137
Konstantina Theresia Vozikis

Evaluation of Effect of Traffic Signal Coordination System on Congestion 143
Mahmood Mahmoodi Nesheli, Othman Che Puan, Arash Moradkhani Roshandeh

Evaluation of the Bikeability of a Greek City: Case study "City of Volos" 149
Eliou Nikolaos, Galanis Athanasios, Proios Apostolos

Need for Land-Use Forecasting Improvements in Integrated Transportation-Land Use Planning 153
Ardeshir Anjomani

A Study on the Factors that Influence local Environmental quality in the Miaoli County of Taiwan 159
Kuei-Yang Wu, Hong-Di Huang

Endowing Urban Vehicle Traffic with Real-Time Features 165
Tiberiu S. Letia, Mihai Hulea, Florin Dinga

Optimization of Urban Vehicle Traffic Using Genetic Fuzzy Logic Control 171
Tiberiu S. Letia, Mihai Hulea, Florin Dinga

Emerging Social Dilemmas in Managing Transportation-Related Carbon Footprint in Optimal Urban Infrastructure Development 177
Loukas Dimitriou, Antony Stathopoulos

Authors Index 186

Keynote Lecture 1

Embedded Systems Design – Scientific Challenges and Work Directions

Professor Joseph Sifakis
Verimag & ARTIST2 NoE
Centre Equation
2 avenue de Vignate
38610 GIERES, FRANCE
E-mail: Joseph.Sifakis@imag.fr

Abstract: The development of a satisfactory Embedded Systems Design Science provides a timely challenge and opportunity for reinvigorating Computer Science. Embedded systems are components integrating software and hardware jointly and specifically designed to provide given functionalities, which are often critical. They are used in many applications areas including transport, consumer electronics and electrical appliances, energy distribution, manufacturing systems, etc. Embedded systems design requires techniques taking into account extra-functional requirements regarding optimal use of resources such as time, memory and energy while ensuring autonomy, reactivity and robustness. Jointly taking into account these requirements raises a grand scientific and technical challenge: extending Computer Science with paradigms and methods from Control Theory and Electrical Engineering. Computer Science is based on discrete computation models not encompassing physical time and resources which are by their nature very different from analytic models used by other engineering disciplines.
We summarize some current trends in embedded systems design and point out some of their characteristics, such as the chasm between analytical and computational models, and the gap between safety critical and best-effort engineering practices. We call for a coherent scientific foundation for embedded systems design, and we discuss a few key demands on such a foundation: the need for encompassing several manifestations of heterogeneity, and the need for design paradigms ensuring constructivity and adaptivity.
We discuss main aspects of this challenge and associated research directions for different areas such as modeling, programming, compilers, operating systems and networks.

Brief Biography of the Speaker: Joseph Sifakis is a CNRS researcher and the founder of Verimag laboratory (http://www-verimag.imag.fr/), in Grenoble, France. He holds the INRIA-Schneider endowed industrial chair since September 1st 2008. He studied Electrical Engineering at the Technical University of Athens and Computer Science at the University of Grenoble. Verimag is a leading research laboratory in the area of critical embedded systems. It developed the underlying theory and technology for the SCADE tool, used by Airbus for the design and validation of its critical real-time systems, and is becoming a de facto standard for aeronautics. Verimag has a lasting and strategic collaboration with ST Microelectronics, France Telecom R&D, and Airbus, through which numerous results on validation and testing have been transferred. Joseph Sifakis is recognized for his pioneering work on both theoretical and practical aspects of Concurrent Systems Specification and Verification. He contributed to emergence of the area of model-checking, currently the most widely-used method for the verification of industrial applications. His current research activities include component-based design, modeling, and analysis of real-time systems with focus on correct-by-construction techniques (http://www-verimag.imag.fr/~sifakis/). Joseph Sifakis has broad experience with industry, notably though joint projects with partners such as Astrium, the European Space Agency, France Telecom, ST Microelectronics and he has also been active for many years in consulting. Joseph Sifakis is the Scientific Coordinator of the European Network of Excellence ARTIST2 on Embedded Systems Design. (http://www.artist-embedded.org/). This network gathers 35 of the best European teams in the area, and aims to produce innovative results for cost-effective design of dependable embedded systems. It will also promote innovative methods safe and secure systems, notably through cooperation with key European industrial partners such as Thales, Airbus, Ericsson, Philips, and ST Microelectronics. Joseph Sifakis is the director of the CARNOT Institute "Intelligent Software and Systems" in Grenoble (http://www.carnot-lsi.com/). Joseph Sifakis is a member of the editorial board of several journals, co-founder of the International Conference on Computer Aided Verification (CAV) and a member of the Steering Committee of the EMSOFT (Embedded Software) conference. He is a member of Academia Europea (http://www.acadeuro.org/) and a member of the French National Academy of Engineering (http://www.academie-technologies.fr/).
Joseph Sifakis has received with Ed Clarke and Allen Emerson for their contribution to Model Checking, the Turing Award for 2007 (http://awards.acm.org/homepage.cfm?srt=all&awd=140). He is also the recipient of the CNRS Silver Medal in 2001.

Keynote Lecture 2

Quantum Cryptography and Chaos Functions: The Ultimate for Network Security

Professor Stamatios Kartalopoulos
Williams Professor in Telecommunications Networking
The University of Oklahoma
USA
Email: Kartalopoulos@ou.edu

Abstract: As the sophistication of intruders' increases, so does the incidents of information integrity breaches and network attacks. In response, very complex cryptographic processes have started being employed, such as chaos theory and quantum theory, in an effort to create the "holy grail" of cryptographic systems and network security.
Quantum theory defines the non-classical qubit, which is the superposition of quantum states having no classical analog. In addition, it is based on the "no cloning" or "no copying" theorem and on Heisenberg's uncertainty. Both, the qubit and the no-cloning theorem, along with the quanto-mechanical properties of photons, have been applied to a new breed of cryptography and secure optical communication networks known as quantum cryptography and quantum networks, respectively.
Chaos is based on the particular behavior of certain non-linear functions, which for a minute change of parameters produce a very large and unstable output, known as the "chaotic regime". However, this chaos is reproducible, which also makes it attractive to secure communications.
In this talk we explain quantum cryptographic protocols as well as chaos and chaotic processes with simple examples. We then describe how chaos functions are used in quantum cryptography in order to increase efficiency and speed of the quantum key establishment.

Brief Biography of the Speaker: Stamatios V. Kartalopoulos, PhD, is currently the Williams Professor in Telecommunications Networking at the University of Oklahoma. His research emphasis is on optical communication networks (FSO, long haul and FTTH), optical technology including optical metamaterials, and optical communications security including quantum cryptography and key distribution. Prior to this, he was with Bell Laboratories where he defined, led and managed research and development teams in the areas of DWDM networks, SONET/SDH and ATM, Cross-connects, Switching, Transmission and Access systems. He has received the President's Award and many awards of Excellence.
He holds nineteen patents in communications networks, and has published more than hundred fifty scientific papers, nine reference textbooks important in advanced fiber optic communications and security, and has also contributed several chapters to other books.
He has been an IEEE and a Lucent Technologies Distinguished Lecturer and has lectured at international Universities, at NASA and conferences. He has been keynote speaker of major international conferences, has moderated executive forums, has been a panelist of interdisciplinary panels, and has organized symposia, workshops and sessions at major international communications conferences.
Dr Kartalopoulos is an IEEE Fellow, chair and founder of the IEEE ComSoc Communications & Information Security Technical Committee, member at large of IEEE New Technologies Directions Committee, and has served editor-in-chief of IEEE Press, chair of ComSoc Emerging Technologies and of SPCE Technical Committees, Area-editor of IEEE Communications Magazine/Optical Communications, member of IEEE PSPB, and VP of IEEE Computational Intelligence Society.

Keynote Lecture 3

Content-Adaptive Efficient Resource Allocation for Packet-Based Video Transmission

Professor Aggelos K. Katsaggelos
Department of EECS
Northwestern University
Evanston, Illinois
USA
E-mail: aggk@ece.northwestern.edu

Abstract: Supporting video communication over lossy channels such as wireless networks and the Internet is a challenging task due to the stringent quality of service (QoS) required by video applications and the many channel impairments. Two important QoS characteristics for video are the degree of signal distortion and the transmission delay. Another important consideration is the cost associated with transmission, for example, the energy consumption in the wireless channel case and the cost for differentiated services in the Internet (with DiffServ) case.
In this presentation we consider the joint adaptation of the source coding parameters, such as the quantization step-size and prediction mode, along with the physical layer resources, such as the transmission rate and power. Our goal is to provide acceptable QoS while taking into account system constraints such as the energy utilization. We discuss a general framework that allows a number of "resource/distortion" optimal formulations for balancing the requirements of different applications. We conclude the presentation with some of the grand opportunities and challenges in designing and developing video communication systems.

Brief Biography of the Speaker: Aggelos K. Katsaggelos received the Diploma degree in electrical and mechanical engineering from the Aristotelian University of Thessaloniki, Greece, in 1979 and the M.S. and Ph.D. degrees both in electrical engineering from the Georgia Institute of Technology, in 1981 and 1985, respectively. In 1985 he joined the Department of Electrical Engineering and Computer Science at Northwestern University, where he is currently professor. He is also the Director of the Motorola Center for Seamless Communications and a member of the Academic Affiliate Staff, Department of Medicine, at Evanston Hospital.
Dr. Katsaggelos is a member of the Publication Board of the IEEE Proceedings, the IEEE Technical Committees on Visual Signal Processing and Communications, and Multimedia Signal Processing, the Editorial Board of Academic Press, Marcel Dekker: Signal Processing Series, Applied Signal Processing, and Computer Journal. He has served as editor-in-chief of the IEEE Signal Processing Magazine (1997-2002), a member of the Publication Boards of the IEEE Signal Processing Society, the IEEE TAB Magazine Committee, an Associate editor for the IEEE Transactions on Signal Processing (1990-1992), an area editor for the journal Graphical Models and Image Processing (1992-1995), a member of the Steering Committees of the IEEE Transactions on Image Processing (1992-1997) and the IEEE Transactions on Medical Imaging (1990-1999), a member of the IEEE Technical Committee on Image and Multi-Dimensional Signal Processing (1992-1998), and a member of the Board of Governors of the IEEE Signal Processing Society (1999-2001). He is the editor of Digital Image Restoration (Springer-Verlag 1991), coauthor of Rate-Distortion Based Video Compression (Kluwer 1997), co-editor of Recovery Techniques for Image and Video Compression and Transmission, (Kluwer 1998), and co-author of Super-Resolution for Images and Video, (Morgan and Claypool, 2007), and co-author of Joint Source-Channel Video Transmission (Morgan and Claypool 2007). He was the holder of the Ameritech Chair of Information Technology (1997-2003), and he is the co-inventor of twelve international patents, a Fellow of the IEEE (1998) and SPIE (2009), and the recipient of the IEEE Third Millennium Medal (2000), the IEEE Signal Processing Society Meritorious Service Award (2001), an IEEE Signal Processing Society Best Paper Award (2001), an IEEE ICME Best Paper Award (2006), and an IEEE ICIP Paper Award (2007). He was a Distinguished Lecturer of the IEEE Signal Processing Society for 2007-2008.

Keynote Lecture 4

Computer Aided-Visual Perception : Challenges and Perspectives

Professor Nikos Paragios
Ecole Centrale de Paris / INRIA Saclay, Ile-de-France
France
E-mail: nikos.paragios@ecp.fr

Abstract: Computer aided human perception aims at developing intelligent algorithms towards understanding visual cues coming from images, video, or other means of gathering visual information. Such a process often consists of three stages, initially the problem of perception is parameterized through a mathematical model where the estimation of its parameters will lead to visual understanding. Then, the model is associated with the available observations through the definition of an objective function and last, this function is optimized using computational methods. The main challenges that one has to address in this context is the curses of dimensionality, non-linearity, non-convexity and modularity. In simple words, even the simplest possible perception problem could involve too many parameters where the association between the data and them is not straightforward and is done through non-convex functions. In this talk, we will present a generic mathematical framework that exploits recent advances in discrete optimization to address computational visual perception. Numerous image processing, computer-aided diagnosis and computer vision applications will be considered to demonstrate the potentials of this method.

Brief Biography of the Speaker: Nikos Paragios (http://vision.mas.ecp.fr) obtained his B.Sc. (highest honors, valedictorian) and M.Sc. (highest honors) in Computer Science from the University of Crete (Greece) [1994,1996] , his Ph.D. in electrical and computer engineering from I.N.R.I.A. [2000] and his D.Sc. (Habilitation a Diriger de Recherches) from the University of Nice/Sophia Antipolis (France) [2005)]. He is professor of applied mathematics at the Ecole Centrale de Paris - one of most exclusive engineering schools "Grande Ecoles" - leading the Medical Imaging and Computer Vision Group. He is also affiliated with INRIA Saclay Ile-de-France, the French Research Institute in Informatics and Control heading the GALEN group. Prior to that he was professor/(2004-2005) at the Ecole Nationale de Ponts et Chaussees, affiliated with Siemens Corporate Research (Princeton, NJ, 1999-2004) as a project manager, senior research scientist and research scientist. In 2002 he was an adjunct professor at Rutgers University and in 2004 at New York University. N. Paragios was a visiting professor at Yale University in 2007.
Professor Paragios has co-edited four books, published more than hundred papers (DBLP server) in the most prestigious journals and conferences of medical imaging and computer vision, gave more that hundred invited lectures, and has twelve US issued patents and more than twenty pending. His work has approx 3,500 citations in googlescholar and approx 2,000 in scopus, and and his H-number according to scholar is 28 and 24 according to scopus. He is a Senior member of IEEE, associate editor for the IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), area editor for the Computer Vision and Image Understanding Journal (CVIU) and member of the Editorial Board of the International Journal of Computer Vision (IJCV), the Medical Image Analysis Journal (MedIA) and the Journal of Mathematical Imaging and Vision (JMIV). Professor Paragios is one of the program chairs of the 11th European Conference in Computer Vision (ECCV'10, Heraklion, Crete). In 2008 N. Paragios was the laureate of one of Greece's highest honor for young academics and scientists of nationality or descent (world-wide), the Bodossaki Foundation Prize in the field of applied sciences. In 2006, he was named one of the top 35 innovators in science and technology under the age of 35 from the MIT's Technology Review magazine. He and his collaborators were the recipients of numerous scientific rewards, like for example the Francois Erbsmann prize for the IPMI'07 conference. His research interests are in the areas of computer vision, medical image analysis and human-computer interaction.

Keynote Lecture 5

Control and Estimation Theory: Current Trends, New Challenges, & Directions for the Future

Professor Lena Valavani
Fellow, American Institute of Aeronautics and Astronautics
Laboratory for Information and Decision Systems
Massachusetts Institute of Technology
Cambridge, MA 02139 U.S.A.
E-mail: valavani@mit.edu

Abstract: Despite the tremendous strides witnessed in the Control and Estimation of lumped parameter systems , whether linear or nonlinear, the issue of stability and performance robustness under simultaneous structured and unstructured uncertainty still remains largely unresolved. When fault tolerance, autonomy and reactivity are added to the requirements, this presents an additional challenge. 'Closed form' solutions are in most cases not possible and computational methods (optimization based, search, etc.) do not provide the necessary guarantees.
The challenges become even greater in the case of distributed systems and networks, such as large industrial/manufacturing plants, environmental applications (CO2 sequestration), communications networks, traffic networks (aeronautical, highway), space networks (satellite constellations), biomedical applications(CNS studies) which, by their nature, require control and estimation in a distributed setting. Requirements and specifications can also be widely variable between safety critical and socially/economically significant systems.
It becomes increasingly evident that control, communications and computation need to be synergistically combined through a 'universal formalism' and novel paradigms that combine logical operations (symbolic reasoning and decision making) with analytical constructs (mathematical algorithms)and continuous quantities(throughput, subsystem interconnections), in order to handle heterogeneity, asynchronicity , real time functionality, properties that typically characterize distributed systems/networks.
We focus on some representative examples to elucidate key issues that arise in modeling, algorithm design, computation, in order to ensure robustness , fault tolerance, autonomy and even reactivity of distributed systems/networks, that point to the need for total synergy of Control, Communications , and Computation/Computer Science- to meet today's and future challenges.

Brief Biography of the Speaker: Lena Valavani holds her B.S. in Physics, from Barnard College, Columbia University, and the M.S., M.Phil. and Ph.D degrees in Engineering and Applied Science from Yale University. After postdoctoral positions at Yale and MIT's Laboratory for Information and Decision Systems, she joined the Department of Aeronautics and Astronautics, MIT, where she was Boeing Associate Professor. She also served as Chief Scientist, Systems Engineering, U.S. D U.S. Department of Transportation for four years. She is currently president of Hellenic Space Systems , S .A.
Dr. Valavani served as Associate Editor of IEEE Transactions of Automatic Control, Automatica , AIAA Journal of Guidance, Navigation and Control, and the International Journal on Robust and Nonlinear Control. She was elected to the Board of Directors, AIAA, N.E., and served as General Secretary. She also was for a long time a member of the steering committee of the International Physicians for the Prevention of Nuclear War, GBPSR, (1985 Nobel Peace Prize).
Her research interests are in modeling for, and the analysis and synthesis of control systems, estimation and identification, with emphasis on robustness to structured and unstructured uncertainty, fault tolerance and reconfiguration, currently in distributed systems and networks . Her research in the U.S. was supported by NASA, NSF, AFOSR,ONR ,and by private industry , resulting in innovative designs of prototype systems currently in operation in the U.S; in Europe by ESA and EC. She has supervised 27 Ph.D and 29 M.S theses at MIT , and 22 M.S. theses at NTUA and UoA.
Dr. Valavani was consultant to Lincoln Laboratory, C.S.Draper Laboratory , and Bell Helicopter while in the U.S. She received the Best Research Paper Award (1991) from the International Gas Turbine Institute and holds three U.S. Patents in the area of controlling unsteady aerodynamic processes in compressors. She is an Associate Fellow of AIAA.

Plenary Lecture 1

Issues and Opportunities in Sustainable Fuel and Vehicle Technologies

Professor M. Ehsani
G Ph.D., P.E., F. IEEE, F. SAE
Robert M. Kennedy Professor and Director,
Advanced Vehicle Systems Research Program
Department of Electrical and Computer Engineering
Texas A&M University
College Station,
USA
E-mail: ehsani@ece.tamu.edu
Web Site: http://www.ece.tamu.edu/People/bios/Ehsani.html

Abstract: The ever expanding use of personal vehicles in the world is associated with the following major problems.
* Fuel Consumption: Most vehicles require liquid fuel, typically derived from petroleum, which is a finite resource. Worldwide petroleum production is expected to decline starting in 2004 (Deffeyes, Hubbert's Peak). The engines in current vehicles are only about 15–20% efficient.

*Pollution: In cities, the tailpipe emissions of vehicles degrade air quality. Also, the combustion of fossil fuels is implicated in global warming. In the United States, 20% of carbon dioxide emissions come from automobiles and 10% from trucks (http://www.ecobridge.org/content/g_cse.htm).

These problems with vehicles have long been known. There has been substantial progress in reducing tailpipe emissions using advanced catalytic converters; however, air quality is still unacceptable in many cities, primarily due to vehicle emissions.
Unless we take a revolutionary approach, the problems with vehicles will only get worse. By 2050, the number of vehicles is expected to increase by 5 times. Currently, the world has 9 people per vehicle, but by 2050 it is expected to have 2.6 people per vehicle.
In this key note presentation, new technology trends of the present and near future will be presented, leading to the need for a viable automobile and fuel technologies that are sustainable. I will propose an integrated approach to the automobile that focuses both on fuel production and vehicle power train technologies. The result is a new automobile and energy industry with the following properties: sustainable fuel supply into the indefinite future, higher efficiency, better performance, and no net carbon dioxide emissions to the atmosphere.
I will also review some of the technical, commercial, and social problems and issues that are on the forefront at the present. The presentation will conclude with comments about the technical realities versus the public knowledge of these issues.

Brief Biography of the Speaker: M. Ehsani has been a researcher, consultant, and educator in energy systems, power electronics, and automotive systems over the past 33 years. He is the author of over 300 publications, 12 books, 23 patents, and numerous published reports and articles on the above topics. He has also served as a consultant to over 60 companies and many government agencies around the world.
He has been recognized on numerous occasions internationally for his technical contributions and has won many IEEE, SAE, government, and industrial awards and honors, such as IEEE Vehicular Society 2001 Avant Garde Award for "Contributions to the theory and design of hybrid electric vehicles."
He is Robert M. Kennedy endowed chair professor of electrical engineering at Texas A&M University, in College Station, Texas, and has also been named the Halliburton Professor, Dresser Industries Professor, BP Amoco Faculty, and Ruth & William Neely/ Dow Chemical Faculty Fellow in the same university.

In 2003, he was selected for the IEEE Field Award for Undergraduate Teaching “For outstanding contributions to advanced curriculum development and teaching of power electronics and drives.”

He is a Fellow if IEEE (1994) and a Fellow of SAE (2005) and has served in many leadership positions in both of these professional societies. Presently he serves on the AdCom of IEEE Power Electronics Society, and Board of Governors of IEEE Vehicular Technology Society. We was the founding chairman of the IEEE Vehicle Power and Propulsion Conference Steering Committee.
Ehsani is a registered Professional Engineer in the State of Texas.

Plenary Lecture 2

From Industrial to Postindustrial Landscapes – Brownfield Reuse in Shrinking Cities

Professor Thomas Panagopoulos
Centro de Investigacao sobre Espaco e Organizacoes (CIEO)
Faculdade de Ciencias e Tecnologia
Universidade do Algarve, Campus de Gambelas, Faro
PORTUGAL
E-mail: tpanago@ualg.pt

Abstract: In last decades, the phenomenon of shrinking cities has many examples in most developed countries. According to Wiechmann (2008) 54% of the European cities lost population in the period from 1996 to 2001. The phenomenon of urban shrinkage is based on several processes of transformation. The number and aggregate size of brownfield sites in the cities of Europe is increasing. In many developed countries, which in past decades have experienced the impact of shrinkage processes, the essential causes have been suburbanization, deindustrialization, demographic shrinkage, and post-fordist transformations. Lisbon is in the 10 cities with the highest relative loss of more than 1.75% annually. Old industrialized cities (typical examples are Glasgow, St. Etienne, or Gelsenkirchen) has led to shrinking, in some ways similar to those in American metropolises like Detroit, Pittsburgh, and Cleveland. This is particularly the case of Eastern Europe, where the combination of post-socialist and post-fordist transformation processes led to exceptionally severe shrinkage phenomena. Certainly, urban shrinkage as such is not a new phenomenon and according to Beauregard (2003) is inseparable from the history of the city. Numerous studies have analysed its manifestations and causes and the development and decline of cities has been viewed as a natural process whereby urban change results from a life cycle that ends in inevitable decline Van den Berg, L. et al. (1982), that may pass from can be seen to go through four successive development stages: urbanisation, suburbanisation, de-urbanisation and re-urbanisation.
Derelict and contaminated industrial sites are unrealized resources for initiating urban regeneration and ecological restoration. These sites are often in advantageous locations near city centers, situated along waterways, supported by existing infrastructure, and adjacent to residential communities. These Landscapes are environmentally impaired assets that need to be returned to productive use, and reintegrated into the surrounding community. The shrinking city syndrome is leaving planners and city officials with, among other things, the challenge of preserving and reusing buildings with architectural and cultural interest. To exemplify the importance of those spaces in the urban landscape, this presentation will analyze two industrial landscape reclamation projects realized in Portugal during the last decade (Parque Tejo-Trancao-Expo 98 and Braga Stadium-Euro 2004) and compare them with other examples from around the world. The significance of those projects to achieve a sustainable urban landscape is discussed. This presentation will show that the industrial landscape should be viewed as a resource and its recovery as an opportunity to develop new multi-functional landscapes.

Brief Biography of the Speaker: Professor Thomas Panagopoulos received the B.Sc. in Forestry from Aristotle University, the M.Sc. in Renewable Natural Resources from the Mediterranean Agronomic Institute, the Ph.D. from Faculty of Geosciences Aristotle University. The area of his PhD is landscape reclamation. He has published more than 120 papers in Journals and Conferences.
Thomas Panagopoulos is a faculty member in the Landscape Architecture department at the Faculty of Cience and Technology at the University of Algarve, Portugal where he has been Department Head and Landscape Architecture Degree Director, and presently coordinating research works on natural, rural and industrial landscape management and reclamation. He is Invited Academic Lecturer in various Universities and Research Organizations like: Michigan Sate University USA, Huelva University Spain, Aristotle University Greece.
He is Fellow of the International Union of Forest Research Organization (IUFRO), of the Global Network for Environmental Science and Technology (GlobalNEST), the WSEAS (The World Scientific and Engineering Academy and Society), the European Network for Research on Desertification (DesertNet) and the American Society of Mining and Reclamation (ASMR).
In 2007 he founded a new research unit in the University of Algarve: Centro de Investigacao sobre Espaco e Organizacoes (CIEO) with 19 PhD members. He is member of the Executive Committee of the CIEO and leader of the “Spatial Organization and Sustainability” which was recently evaluated as very good from international panel.

Plenary Lecture 3

The Fuel Temperature Influence on Gas Emissions when used as Fuel Diesel-Olive Seed Oil Blends

Professor Charalampos Arapatsakos
Department of Production and Management Engineering
Democritus University of Thrace, Xanthi
Greece
E-mail: xarapat@agro.duth.gr

Abstract: The quality of fuel affects diesel engine emissions (HC, CO, NOx and particulate emissions) very strongly. Fuel emissions composition and characteristics depend on mixture formation and combustion. This paper examines the effect of temperature of fuel in the gas emissions that is used in four-stroke diesel engine. The temperatures of fuel that were used are 10oC, 20oC, 30oC, 40oC, 50oC and 60oC. The fuel mixtures used are the following: diesel-5% olive seed oil, diesel-10% olive seed oil, diesel-20% olive seed oil, diesel-30% olive seed oil, diesel-40% olive seed oil, diesel-50% olive seed oil. For those fuel temperatures the gas emissions of carbon monoxide (CO), hydrocarbons (HC), nitrogen monoxide (NO), particulate emissions (smoke) are being measured and the fuel consumption is also examined.

Brief Biography of the Speaker:
Born in: Athens, Greece
Citizenship: Greek
Titles:
-Mechanical Engineer, Ph.D. (Democitus University of Thrace-Greece), Assoc. Professor on University of Thrace-Greece
Present Responsibilities:
-Member of Technical Chamber of Greece
-Member of Electrical and Mechanical Engineering Association
-Member of Combustion Institute of Greece
Participations:
I took part in many research programs, which referred to biofuels, gas emissions, antipollution technology.
Research domains:
Biofuels and their use in internal combustion engines, power variation from the use of biofuels, gas emissions and mechanical damages.

Plenary Lecture 4

Planning for Metropolitan Regions: The Land-Use & Transportation Connection

Professor Ardeshir Anjomani
School of Urban and Public Affairs
The University of Texas at Arlington
USA
E-mail: anjomani@uta.edu

Abstract: Today, almost every urban region all over the world is continuously planning for the future development of their region with a particular emphasis on transportation and implementing these plans that are affecting almost every aspect of life in each of these regions at an enormous cost in terms of not only financial but also externalities. I will identify and discuss the interesting interconnections and interactions and methodological challenges regarding land-use and transportation planning, as well as other major systems affecting the development of urbanized regions. While the models and methods utilized in forecasting and planning towards these efforts has come a long way, and we have also seen the maturation of these approaches, there is still a lot left to be developed and to be included in these models and methods. Theoretical and technological advancement of the last few decades has instigated a new wave of attention, research and further developments of the models and techniques from a variety of disciplines has emerged. The integration of land use and travel demand models has been a major outcome of these interdisciplinary efforts in the recognition of and allowing for the interactions and feedback loops that can occur across these twin systems. Yet, there are other important aspects that are not fully included in practice or theory, and are insufficient towards a comprehensive approach in land-use/transportation planning. The increasing social consciousness on environmental concerns has major implications on the modeling approaches because of land-use/transportation and the way in which developments impact the environment. Moreover, the recent global economic contraction in the context of continuous urbanization and growth of metropolitan regions is a major factor influencing developments in the United States and around the world.

Brief Biography of the Speaker: Ardeshir (Ard) Anjomani is a professor of City and Regional Planning at the School of Urban and Public Affairs, The University of Texas at Arlington. Dr. Anjomani has more than thirty years of academic and professional experience in different aspects of City planning and urban and regional development. His areas of expertise include analysis of urban development, land-use planning and urban design, land suitability analysis and use of GIS technology for spatial analyses, transportation planning and community and economic development. His publications have appeared in International Journal of Humanities, Socio-Economic Planning Sciences, International Journal of Public Administration, Journal of Architecture and planning Research, Journal of Planning Education and Research and Journal of Urban Affairs among others. He is the Associate Editor of the International Journal of Society Systems Science (IJSSS) and he has served on the Editorial Boards of The Journal of Architectural and Planning Research, 1983-present, Computer, Environment and Urban Systems, 1988-1992, and International Journal of Sustainable Society (IJSSoc), 2007-present. Dr. Anjomani presently is serving as Chair of Ph.D. Program in Urban Planning & Public Policy and Master's in City & Regional Planning. He also is the Coordinator for the GIS Certificate Program (2000-present) and has been Coordinator and Graduate Advisor for the City and Regional Planning Program for six years. He has been the University of Texas at Arlington nominee for the State of Texas Piper Professorship Award for outstanding scholarly and academic achievement, April 2000. He has an M.Arch. degree from the University of Tehran, an M.Pl. and a Ph.D. in City and Regional Planning from the University of Southern California. Dr. Anjomani teaches graduate courses in urban structure and city planning, transportation planning and modeling, research and planning methods, and GIS and land use analysis. For the more than two decades his research concentrations have been on study and forecasting of metropolitan growth and urban form, and land-use planning through applications of planning methods and GIS technology. He has received and completed several funded research and presently is working on a land use/transportation modeling research funded by the Texas Department of Transportation. He has also been consultant in several projects dealing with comprehensive land-use/thoroughfare planning, development planning, urban design, corridor studies, downtown development studies and economic development. Dr. Anjomani is a specialist in the various aspects of city planning and the related research and analysis. He combines experience in professional planning and design with academic

and applied research and teaching experience. The community related projects that have been developed under his direction have been seven times recipient of American Planning Association Texas Chapter Student Planning Award.

Authors Index

Garcia, A. M.	91,	99,	105	Mouzna, J.	84		
Abbas, A.	70			Vozikis, K. T.	137		
Karkanis, A.	37			Wu, K. Y.	159		
Stathopoulos, A.	177			Dimitriou, L.	177		
Roshandeh, A. M.	143			Nesheli, M.	143		
Anjomani, A.	153			Valentini, M. P.	23		
Arapatsakos, C.	29,	37,	45	Hulea, M.	165,	171	
Chu, C. W.	111			Choudhary, M. A.	70		
Miranda, D.	91,	99,	105	Arshad, M.	70		
Christoforidis, D.	29,	37,	45	Khan, N.	70		
Koutseris, E.	58,	64		Puan, O.	143		
Nikolaos, E.	149			Scarlatos, P.	125		
Gundersen, E.	125			Apostolos, P.	149		
Kaisar, E. I.	125			Doan, Q. C.	84		
Dinga, F.	165,	171		Crecente, R.	91,	99,	105
Capua, F. D.	117			Zekovic, S.	78		
Fusco, G.	23			Gkavaki, S.	29,	45	
Athanasios, G.	149			Berradia, T.	84		
Bilotta, G.	117			Panagopoulos, T.	51		
Huang, G. D.	159			Letia, T. S.	165,	171	
Lin, H. F.	111			Capotescu, V.	131		
Sante, I.	91,	99,	105	Conti V.	23		
Yen, J. R.	111			Barrile, V.	117		