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Latest Trends on Urban Planning & Transportation

3rd WSEAS International Conference on Urban Planning and Transportation (UPT '10)

Corfu Island, Greece, July 22-24, 2010

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Preface

This year the 3rd WSEAS International Conference on URBAN PLANNING AND TRANSPORTATION (UPT '10) was held on Corfu Island, Greece, July 22-24, 2010. The conference remains faithful to its original idea of providing a platform to discuss urban planning strategy and development, social differences and urbanization, environmental protection, intelligent urban planning systems, transportation in the modern city, urban tourism, sustainable marine ecosystems, climate and global change, cleaner energy systems, energy conservation in industry, air pollution and its effects on ecosystems, soil and agricultural issues, landscape architecture, transportation systems and environment, transportation engineering, public health and transportation, construction-design of roads, airports and harbours design, fuels and fuels policy, air and noise pollution, influence of transportation systems on real estate, transportation in extreme weather conditions 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

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Plenary Lecture 1

Strategies of Urban Pollution Diminishing by Controlling Emissions of Automotive Engines

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Abstract: This research paper presents an overview of methods of engine emissions controlling related to automotive fleet and road traffic characteristics. As urban populations expand and city roads become increasingly congested, city planners need comprehensive urban development and transport strategies to address deep-seated social and demographic change.
Effective policies must meet multiple objectives:
-Establishing a balance between different modes of transport: public transport, cars, motorcycles, bicycles, and pedestrians;
-Providing security, safety and optimum service for transport system users;
-Maintaining the urban mobility that drives economic development;
-Reducing urban pollution caused by motor vehicles by controlling emissions.
Nowadays urban pollution exposure from road transport has become a great concern in major cities throughout the world, for this reasons is presented the most used active and passive methods for controlling the motor vehicle emissions.
In this paper, it were presented results obtained using a model software ADMS - Urban, on which ADMS-Roads is based, for air quality management and assessment studies of complex situations in towns, motorways, counties and large industrial areas. The ADMS model uses advanced algorithms for the height-dependence of all variables including traffic flows, traffic speeds, emission rates, and the wind speed, turbulence and stability to produce improved predictions.

Brief Biography of the Speaker:
Corneliu Cofaru is a full Professor at the Automotive and Engine Department within the Mechanical Engineering Faculty from Transilvania University of Brasov, Romania. His area of expertise is the environmental aspects of internal combustion engines. He authored or co-authored over 200 scientific papers published in reviewed journals or presented at international conferences organized by FISITA, EAEC, SIAR, etc. He wrote as author and co-author 23 books. Two of these are written in English and are entitled: "Materials-Energy Sustainable Development" published in 2002 and "Transport and Environmental Engineering" published at the Transilvania University Publishing House in 2007. He had the opportunity to manage international projects in Tempus and Leonardo da Vinci frame and he is a member of Romanian society of automotive engineers.

Plenary Lecture 2

Traffic Incident Management System in Urban Area

Professor Sadko Mandzuka
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Abstract: Demand for urban traffic and general people mobility is increasing rapidly in Europe crowded cities and towns. Some new possibilities of urban traffic and mobility solutions, using new Control Strategy and Intelligent Transportation System (ITS) approach, are presented. Traffic incident impacts the normal operation of traffic system, even results in paralysis of partial functions of one city. Researches have shown that automated real-time Traffic Incident Management System (TIMS) can reduce serious consequences. Some EU experiences about new Control Algorithm in Incident Management System in urban conditions are described. It is very important that the final design should consider the total life-cycle of the Urban TIMS including not only the technical merits of potential solutions but also the costs and relative value of alternatives. This talk takes forward a research line we started to investigate a two year ago and the most promising results are reported.

Brief Biography of the Speaker:
Prof. Sadko Mandzuka is currently a professor at the Department of Intelligent Transport System, Faculty of Traffic Science, University of Zagreb. He has wide experience in the area of floating vessels control theory, Intelligent Transport System, artificial intelligence, traffic incident management system etc. He had the opportunity to work both in academic and industrial environments including Brodarski Institute, Consulting in the Innovation Area for SME's, etc. He is currently setting up a spin-off company providing consulting services for Intelligent Transport System (Incident Management System and other) while at the same time advancing his academic career. He is a founding member of Croatian Robotic Association, vice president of ITS-Croatia, and Collaborating member of Croatian Academy of Engineering. He is a member of Technical Commitee on Marine Systems (Coordinating Committee on Transportation and Vehicle Systems - IFAC (International Federation of Automatic Control). Finally he has served in the program committees and as reviewer at several international congress and conferences. He is author of more than 70 internationally reviewed publications.

Plenary Lecture 3

Analysis and CFD Simulation of Flooding Flows and Scouring Around Bridges and Transportation Structures

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Abstract: Bridges are significant component of the urban and ground transportation infrastructure. The 'bridge hydraulic analysis and design' could be substantially enhanced using advanced commercial Computational Fluid Dynamics (CFD) software and powerful parallel computing resources. Key objectives are to evaluate the capabilities of the state-of-the-art CFD codes for the prediction of experimental results for lift and drag forces and scouring on inundated bridges, conducted at Turner-Fairbank Highway Research Center (TFHRC), and the development of "best practices" for the application of the CFD. These research activities are part of a multi-year program initiated by Argonne National Laboratory with the US Department of Transportation (USDOT), to establish the Transportation Research and Analysis Computing Center (TRACC), a national supercomputing user facility for advanced computing, visualization, and high-speed networking, based on a massively parallel computer system.
Early results have focused on the examination and determination of best practices, with emphasis on mesh spacing, time step selection and turbulence modeling. Preliminary two-dimensional model results show reasonable agreement with limited experimental data. Present work focuses on further development and optimization of the simulation methods and development of three-dimensional scouring models.
Future activities will address diverse research needs of the transportation community in bridge hydraulics, including the assessment of lift and drag forces on bridge decks when flooded, analysis of sediment transport and its influence on scouring, optimization of bridge deck-shapes to minimize flow forces and pressure flow scour, evaluation of active and passive scour countermeasures, and addressing environmental issues such as fish passage through culverts.

Brief Biography of the Speaker:
Professor Kostic's teaching and research interests are in Thermodynamics (a science of energy, the Mother of All Sciences), Fluid Mechanics, Heat Transfer and related fluid-thermal-energy sciences; with emphases on physical comprehension and creative design, experimental methods with computerized data acquisition, and CFD simulation; including nanotechnology and development of new-hybrid, POLY-nanofluids with enhanced properties, as well as design, analysis and optimization of fluids-thermal-energy components and systems in power-conversion, utilizations, manufacturing and material processing. Dr. Kostic came to Northern Illinois University from the University of Illinois at Chicago, where he supervised and conducted a two-year research program in heat transfer and viscoelastic fluid flows, after working for some time in industry.
Kostic received his Dipl-Eng (B.S.) degree with the University of Belgrade Award as the best graduated student in 1975. Then he worked as a researcher in thermal engineering and combustion at Belgrade-Vinca Institute for Nuclear Sciences, which then hosted the headquarters of the International Center for Heat and Mass Transfer, and later taught at the University of Belgrade in ex-Yugoslavia (*). He came to the University of Illinois at Chicago in 1981 as a Fulbright grantee, where he received his Ph.D. in mechanical engineering in 1984. Subsequently, Dr. Kostic worked several years in industry. In addition, he spent three summers as an exchange visitor in England, West Germany, and the former Soviet Union.
Dr. Kostic has received recognized professional fellowships and awards, including multiple citations in Marquis' "Who's Who in the World," "Who's Who in America," "Who's Who in American Education," and "Who's Who in Science and Engineering"; the Fulbright Grant; NASA Faculty Fellowship; Sabbatical Semester at Fermilab as a Guest Scientist; and the summer Faculty Research Participation Program at Argonne National Laboratory. He is a frequent reviewer of professional works and books in Thermodynamics and Experimental Methods. Dr. Kostic is a licensed professional engineer (PE or P.Eng.) in Illinois and a member of the ASME, ASEE, and AIP's Society of Rheology. He has a number of publications in refereed journals, including invited state-of-the-art chapters in the Academic Press series Advances in Heat Transfer, Volume 19, and "Viscosity" in CRC Press' Measurement, Instrumentation and Sensors Handbook; as well as invited reference articles: Work, Power, and Energy in Academic

Press/Elsevier's Encyclopedia of Energy; Extrusion Die Design in Dekker's Encyclopedia of Chemical Processing; and Energy: Global and Historical Background, and Physics of Energy, both in Taylor & Francis/CRC Press Encyclopedia of Energy Engineering and Technology. Professor Kostic is a senior member of the Graduate Faculty at Northern Illinois University. More at: http://www.kostic.niu.edu

Plenary Lecture 4

Blends of Gasoline-Ethanol, Methanol used in Internal Combustion Engine

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Abstract: Air pollution is a major global problem as it harms the human respiratory system, plants and property. Among all the pollution sources in a city the road transport emissions are often the most important source. In nowadays there is a great increase in car ownership and use. Therefore, it remains to be seen what measures needs to be adopt, in order to reduce emissions from road traffic and consequently to prevent transport related air pollution problems. One solution of reducing emissions from road traffic is the use of alternative fuels. Alternative fuels are derived from resources other than petroleum. Some are produced domestically, reducing dependence on foreign oil and some are derived from renewable sources. Alternative fuels produce less pollution than gasoline or diesel. The transportation fuels that are made from biomass through biochemical or thermochemical processes are known as biofuels. Examples of well known alternative fuels and particularly biofuels include biodiesel, ethanol and methanol. This paper examines the behavior of a small four-stroke engine when mixtures of gasoline-ethanol and gasoline-methanol are used as fuel. This engine moves a small alternative generator. CO and HC emissions tests were conducted using different mixtures of gasoline-ethanol and gasoline-methanol as fuel, under different load conditions: under full electrical load and without load conditions. These tests showed that when the percentage of ethanol and methanol in the fuel increases the CO and HC emissions decrease. There was an exception with the mixtures: gasoline-90%ethanol, 100%ethanol, for which the engine malfunctioned and the HC emissions were increased. During the tests the regulation of the engine relatively to the air/fuel ratio, maintained the original adjustment that concerned gasoline. It is important to mention that the ethanol that was used was 95i alcoholic degrees and not 100% pure ethanol. Furthermore, during the use of the mixtures of gasoline-ethanol and gasoline-methanol there was a small increase of fuel consumption when the percentage of the ethanol and methanol in the fuel was increased.

Brief Biography of the Speaker:
Dr. Charalampos Arapatsakos is a Greek citizen, who has been born in Athens. He has studied Mechanical of Engineering. He is a Ph.D. Assoc. Professor in the University of Thrace in Greece. At the present he is a member of Technical Chamber of Greece, member of Electrical and Mechanical Engineering Association and member of Combustion Institute of Greece too. Mr C. Arapatsakos has participated in many research programs about biofuels, gas emissions and antipollution technology. His research domains are mainly on biofuels and their use in internal combustion engines, the power variation from the use of biofuels, the gas emissions and mechanical damages.

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