Πανεπιστήμιο Κύπρου
University of Cyprus

School of Engineering
Department of Electrical and Computer Engineering

IEEE
Advancing Technology for Humanity

Department of Electrical and Computer Engineering

Title: **«Quantification of the Effect of ITS on CO2 Emissions from Road Transportation»**

Prof. Zissis Samaras
Mechanical Engineering Department, Aristotle University of Thessaloniki

Wednesday, 10 February 2016, 17:00 – 18:00
Room XOD 02 – 013, New Campus - University of Cyprus

Abstract:
Information and Communications Technology (ICT)/Information and Technology Services (ITS) can play an important role in the transport sector, helping in maintaining accessibility while simultaneously optimising the use of vehicles. In fact, ICT/ITS have the potential to drastically change the way people drive and their mobility patterns, thus potentially reducing energy consumption, air pollutants and CO2 emissions. The main question is how much in quantitative terms. A novel methodology and tool set were developed and validated that can be used to evaluate the impact of ICT-related transport measures on mobility and CO2 emissions of vehicle fleets under real-world conditions. The methodology combines traffic and emission modelling at micro and macro scales. The integration of these scales is an important feature because a measure to influence the behaviour of single vehicles may have an impact on the whole network, while traffic management at the network level may influence the behaviour of single vehicles. The presentation will include results for a number of ITS systems including Variable Speed Limits (VSL), Green Navigation (GN), Urban Traffic Control (UTC), Ecodriving and Adaptive Cruise Control (ACC). These measures have been tested for concrete application cases implemented in the cities of Turin, Madrid and Rome. Starting point were real-world data collected by means of floating cars. The investigations have taken into account different penetration rates of ICT measures, as well as different traffic conditions (e.g. free flow, congested). Each case has been modelled for the current and at least one future fleet composition. The results indicate that ITS are overall able to contribute to CO2 emissions reduction by several percent points; the effects, nevertheless, are different depending on local conditions. The CO2 benefit is also found to be constrained by the penetration rates of the on-road ITS equipped vehicles: as this share increases a maximum is reached at up to 50% penetration rate and under non-congested conditions.

Biography:
Professor Zissis Samaras is Head of the Laboratory of Applied Thermodynamics (LAT) at the Mechanical Engineering Department of the Aristotle University of Thessaloniki, Greece. His research focuses on measuring and computationally simulating fuel consumption and air pollutant emissions from motor vehicles. He is elected Academic Member and Vice Chairman of the European Road Transport Research Advisory Council (ERTRAC) on "Energy, Environment and Resources". He has provided expert advice to a number of organisations and private sector customers, including the European Commission, the European Environment Agency, the World Bank, the European Automobile Manufacturers Association (ACEA), the environmental organization of the European oil industry (Concawe) Rhône-Poulenc, and Toyota Motor Europe. He is the author of more than 250 scientific publications, among them more than 140 in peer-reviewed journals and seven book chapters, with an author h index of 25 (excluding self-citations).