

## **KIOS Distinguished Lecture Series**



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### *Freeway Traffic Control*

#### **LECTURE ABSTRACT**

Daily traffic congestion on freeway networks around the world continues to increase, with detrimental effects on travel times, traffic safety, fuel consumption and environmental pollution. The annual cost of traffic congestion on European roads is estimated to approach 120 b€ or 1% of the GDP. Traffic congestion is only partly due to high demand, since the appearing congestion degrades the expensive infrastructure capacity essentially at the only times it is actually needed, i.e. during the daily peak periods. Traffic control measures, if properly designed and deployed, may lead to substantial savings of travel time, fuel consumption and environmental impact, along with an improvement of traffic safety. The presentation outlines the related traffic control problems and methods, with a focus on optimal control and feedback approaches. More specifically, the areas of macroscopic traffic flow modelling, local and coordinated ramp metering, variable speed limit control, mainstream traffic flow control, merging traffic control and route information and guidance are addressed, along with the presentation of some selected field results. Emerging developments and needs in relation to VACS (vehicle automation and communication systems) are also briefly addressed.

#### **BRIEF BIO**

Markos Papageorgiou received the Diplom-Ingenieur and Doktor-Ingenieur degrees in Electrical Engineering from the Technical University of Munich, Germany, in 1976 and 1981, respectively. He was a Free Associate with Dorsch Consult, Munich (1982-1988), and with Institute National de Recherche sur les Transports et leur Sécurité (INRETS), Arcueil, France (1986-1988). From 1988 to 1994 he was a Professor of Automation at the Technical University of Munich. Since 1994 he has been a Professor at the Technical University of Crete, Chania, Greece. He was a Visiting Professor at Politecnico di Milano, Ecole Nationale des Ponts et Chaussées, MIT, University of Rome La Sapienza and Tsinghua University; and a Visiting Scholar at the University of California at Berkeley. His research interests include automatic control and optimisation theory and applications to traffic and transportation systems, water systems and further areas. He is a Life Fellow of IEEE and a Fellow of IFAC. He received several distinctions and awards, including an ERC Advanced Investigator Grant.

