

IACM Colloquium - Markos Papageorgiou, 11:00, Friday 6th, March

Title:

Lane-free Artificial-Fluid Environment for Vehicular Traffic
(TrafficFluid)

Speaker:

Markos Papageorgiou
PEM, NTUC

Time, Date & Location:

11:00, Friday 6th, March 2020 @ Orphanoudakis Room (main building)

Abstract:

The ERC Advanced Grant TrafficFluid (2019-2024) launches an original idea that may lead to a novel paradigm for vehicular traffic in the era of connected and automated vehicles (CAVs), which is based on two combined principles. The first principle is lane-free traffic, which renders the driving task for CAVs smoother and safer, as risky lane-changing manoeuvres become obsolete; increases the capacity of the roadway due to increased road occupancy; and mitigates congestion-triggering vehicle manoeuvres. The second principle is the vehicle nudging, whereby vehicles may be "pushing" (from a distance, using sensors or communication) other vehicles in front of them; this allows for traffic flow to be freed from the anisotropy restriction, which stems from the fact that human driving is influenced only by downstream vehicles. Vehicle nudging may be implemented in various possible ways, so as to maximize the traffic flow efficiency, subject to safety and convenience constraints.

The combination of these two principles within TrafficFluid provides, for the first time since the automobile invention, the possibility to actively design (rather than merely describe or model) the traffic flow characteristics in an optimal way, i.e. to engineer the future CAV traffic flow as an efficient artificial fluid. To this end, future research work will have to develop the necessary vehicle movement strategies for various motorway and urban road infrastructures, along with microscopic and macroscopic simulators and traffic management actions.

Short bio:

Ο Μάρκος Παπαγεωργίου είναι Καθηγητής στο Πολυτεχνείο Κρήτης. Διετέλεσε Καθηγητής στο Τεχνικό Πανεπιστήμιο Μονάχου (1988-1994) και Επισκέπτης Καθηγητής στα Politecnico di Milano, Ecole Nationale des Ponts et Chaussées, University of California Berkeley, MIT, University of Rome La Sapienza, Tsinghua University κ.α. Είναι συγγραφέας 7 βιβλίων και 500 επιστημονικών άρθρων. Διετέλεσε Editor-in-Chief του περιοδικού Transportation Research – Part C (2005-2012). Είναι Life Fellow του IEEE και Fellow της IFAC. Έχει τιμηθεί με πολλές διεθνείς διακρίσεις και βραβεία για το έργο του με πιο πρόσφατο το 2020 IEEE Transportation Technologies Award. Του έχουν απονεμηθεί δύο ERC Advanced Grants.