

2 PhD openings in the frame of the

ERC Advanced Grant TrafficFluid

TrafficFluid (Lane-free Artificial-Fluid Environment for Vehicular Traffic) is an ERC (European Research Council) Advanced Grant. The principal investigator of TrafficFluid is Prof. Markos Papageorgiou, Technical University of Crete, Chania, Greece. This is an announcement for 2 PhD candidate positions. The successful applicants will be hired, starting 1st of September 2021, the earliest, for a period of up to 4 years. Applications can be emailed to: markos@dssl.tuc.gr.

Project Abstract: TrafficFluid launches an original idea that leads to a novel paradigm for vehicular traffic in the era of connected and automated vehicles (CAVs) and 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 manoeuvres. The second principle is the *nudge effect*, 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. The nudge effect may be implemented in various possible ways, so as to maximize the traffic flow efficiency, subject to safety and convenience constraints.

TrafficFluid combines lane-free traffic with vehicle nudging to provide, for the first time since the automobile invention, the possibility to 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, the project will develop and deliver the necessary vehicle movement strategies for various motorway and urban road infrastructures, along with microscopic and macroscopic simulators and traffic management actions.

Duration of contract: 12 months (with an option for extension up to 4 years).

Occupation: Carrying out research as specified in the Project's Description of Work (DoW).

Salary: 1600 €/month. A salary increase by some 5% per year for the following years will be based on performance.

Required Qualifications:

- Research experience (Diploma/MSc thesis) related to automatic control theory and applications

Desired Qualifications:

- Participation in research projects.
- Experience in dissemination of research results in scientific journals and conferences.
- Language proficiency in spoken and written English.

Set of Application Documents:

- See announcements at the Technical University of Crete website – [LINK](#) –
- or <https://www.euraxess.gr/jobs/655455>