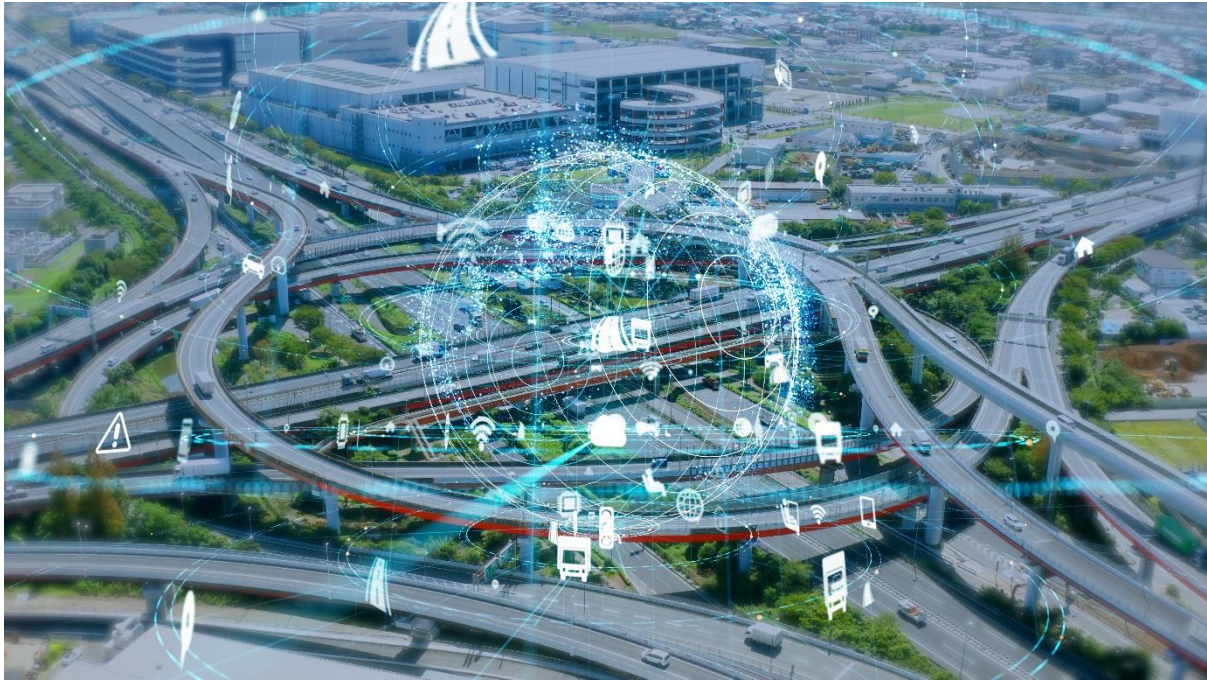# IVORY - Artificial Intelligence for Vision Zero in Road Safety

PhD Candidate Vacancy Description

Within the framework of the Horizon Marie Skłodowska-Curie Actions (MSCA) Industrial Doctoral Network **IVORY - Artificial Intelligence for Vision Zero in Road Safety**, a call for applications for the following Industrial PhD candidate has been launched, to be hosted by National Technical University of Athens (NTUA), a Centre of Road Safety Research Excellence with global recognition.

PhD #9	AI for road safety monitoring and crash prediction from micro to macro levels
Vacancy description	Within the IVORY doctoral network, this PhD position aims (i) to investigate the effect of spatial scale on road safety monitoring and crash prediction, (ii) to develop a new state-of-the-art AI framework to observe and analyse road safety Key Performance Indicators and predict crashes by achieving transition from smaller scales (e.g., on a segment, intersection or neighbourhood level) to larger ones (e.g., highway corridor or prefecture/county level), taking into account the time dimension, and (iii) to assess the effectiveness and scalability of microscopic road safety models for macroscopic crash prediction and vice versa. The position contributes to road safety research by evaluating several scaling combinations that will also feature capabilities of 'zooming in/zooming out' of study areas using different levels of telematics (e.g., trip-based, driver-based or network-based using several drivers) and synthesizing knowledge on comparable advantages and disadvantages for each analysis scale. A case study utilising driver telematics in an urban area will be conducted, with actionable results, compatible with the vision and activities of OSeven – showcasing the

	impact of using AI for micro-analysis based on driver telematics and integrating the findings to larger scales
Project description	IVORY (ivory-network.eu) is a Horizon Europe MARIE SKLODOWSKA-CURIE ACTION Industrial Doctoral Network consisting of 22 partners (universities, industry, and non-governmental organizations). The project aims to develop a new framework for the integration of AI in road safety and train a new generation of leading researchers in the field, in order to address the UN Sustainable Development Goals target 3.6 (halving the number of traffic fatalities by 2030) and EC 'Vision Zero' strategy (eliminating traffic fatalities by 2050). PhD students will obtain their PhD degree from the relevant academic partner, and spend at least 50% of their PhD time at the relevant non-academic partner.
Academic host	National Technical University of Athens (NTUA), Athens, Greece School of Civil Engineering Department of Transportation Planning and Engineering Months 19-36 of PhD
Industry host	OSeven, Athens, Greece, Months 1-18 of PhD
Secondment(s)	EIRA-SI, Ljubljana, Slovenia, Duration: 4 months
Research field(s)	Transport engineering; Traffic safety; Data science; Spatial analysis
Application deadline	16 February 2024
Type of contract	Fixed-term
Employment status	Full time (1.0 fte)
Eligibility criteria	• A Master's degree (or equivalent); • Not in possession of a doctoral degree at the date of the recruitment; • Recruited applicants can be of any nationality and must undertake trans-national mobility (i.e., move from one country to another) when taking up the appointment. In particular, at the time of selection, the recruited applicant for this position must not have resided or carried out their main activity (work, studies, etc.) in Greece for more than 12 months in the 3 years immediately prior to their recruitment. Short stays, such as holidays, are not taken into account.
Required skills	• A Master's degree (or equivalent) in computer science, mathematics, computer/electrical engineering; other Master's degrees (i.e. physics, civil/transport/mechanical engineering) will also be considered, if you have experience in algorithm development • Familiarity and hands-on experience with machine learning algorithms • Familiarity with statistics (statistical tests and regression) and probability distributions • Coding skills in Python • Strong conceptual and analytical skills • Proven capacity to undertake research • Excellent research, academic writing and presentation skills • The ability to work both independently and as part of a team • High level of proficiency in English • Commitment to undertaking multi-year (3 years or more) doctoral research

Optional skills (preferred but not required)	• Familiarity with data handling and manipulation, experience working with big data • Familiarity and hands-on experience with mapping and spatial analysis • Passion about road infrastructure and transport safety fields
English requirement	Proof of English language proficiency at a Common European Framework of Reference (CEFR) level of C1, or an MSc degree in English, or IELTS: minimum 8.0 / TOEFL: minimum 110
Salary	The successful candidate will receive an attractive salary following the MSCA regulations for doctoral candidates. The exact salary will vary depending on the country of the host partner and will be confirmed upon appointment. The salary includes a living allowance, a mobility allowance, and a family allowance (if the recruited doctoral candidate has or acquires family obligations during the duration of the fellowship), and is very competitive overall.
Other benefits	In addition, the doctoral candidate will benefit from extensive training within the IVORY network, which includes internships/secondments in other laboratories, a variety of training courses (including transferable skills), and active participation in workshops and conferences.

Application process	• Candidates should apply electronically using the link indicated in the PhD position(s) of their interest;
	• Candidates should provide the following documents:
	    ○ Detailed CV, including information on the candidate's proficiency in English
	    ○ Motivation letter (1 page), describing why the position fits the applicant
	    ○ Contact information of 2 references

Academic host	The National Technical University of Athens (NTUA) is the oldest engineering school in Greece and it plays a paragon role in the scientific, technical and economic development of Greece but also in Europe and worldwide, consistently ranking as the best Greek technical university. Lately, it is ranked among the top engineering and technology universities (3rd in Europe and 7th worldwide) by Shanghai World University Rankings. NTUA has been involved in more than 160 road safety research projects since the early 1990s, comprising 70 European Commission projects, 14 International Organisation projects (UN-ECE, WHO, EIB, World Bank, ITF, CEDR) and 76 Greek projects. NTUA has well established communication channels to promote research findings: more than 800 road safety scientific publications highly cited globally, including more than 220 in scientific journals and 550 in scientific conferences. The NTUA Road Safety Observatory (NRSO) (www.nrso.ntua.gr) has a widespread recognition at the global road safety community as a center of research and innovation excellence on road safety, having received during the last 10 years more than 150.000 road safety visitors and more than 2,800,000 visits (today steadily more than 3.000 visits per month).
Industry host	OSeven is a VC backed, high technology company and part of Endeavor Global network. The company provides world-class telematics solutions for insurance companies, banks, telecom, automotive, leasing, and fleet management companies around the globe. OSeven's AI-enabled, Big-Data telematics solution analyses data collected from different sources (smartphones, OBD devices, Beacons, connected vehicles) to assess the risk

	associated with driving behaviour and record the vehicle's mileage. Leveraging advanced Machine Learning, OSeven achieves with great accuracy the detection of several risk factors, including harsh braking and acceleration events, speed limit violations and mobile use while driving.
Additional information	For more information about this vacancy, please contact Professor George Yannis at this email address: geyannis@central.ntua.gr