



Immediate PhD Student Position – Electric and Automated Transportation

Tel Aviv University (Israel) & Joint Research Center (Italy)

The European Commission Joint Research Center in Ispra

As the science and knowledge service of the Commission, the mission of the Joint Research Centre is to support EU policies with independent evidence throughout the whole policy cycle. With 7 Scientific Directorates, 3 Corporate Directorates and the DG/DDG Office, the JRC is located in 5 Member States (Belgium, Germany, Italy, the Netherlands and Spain). In terms of scientific production, JRC peer-reviewed publications are 2.26 times more cited than the global average. This is not due to a few extreme outliers, since in the examined period 3.7% of JRC publications belonged to the globally most cited 1% and 24.5% to the globally most cited 10%. Further information is available at: <https://ec.europa.eu/jrc/>

The Sustainable, Smart and Safe Mobility Unit of the Directorate for Energy, Mobility and Climate, is carrying out research activities to address the techno-economic implications of disruptions in the road transport sector. During the PhD course, the successful candidate will spend a period of at least 6 months at the JRC Ispra site as visiting scientist, working within a multidisciplinary dealing with the assessment of the implications of Smart Mobility Solutions on transport efficiency, safety, economy, people behaviour, energy consumption, etc. To this objective both modelling/simulation and experimental activities are carried out.

Tel Aviv University

Tel Aviv University (TAU) is the largest, most comprehensive, and most dynamic research and teaching institution in Israel, offering the country's most diversified range of study and research fields, with nine faculties and over 30,000 students, 1,200 researchers and 125 schools and departments across the sciences, humanities, and arts. Located at the heart of Israel's economic, technological, and cultural center, TAU is proud of its liberal and pluralistic spirit. TAU ranks first in Israel (Times & Taiwan rankings); as a global top 100 innovation university (Reuters); and seventh in the world – and first outside the USA – for producing successful, VC-backed entrepreneurs (PitchBook). The University's cutting-edge advancements are reinforced through ties with prominent research institutions ranging from NASA and Harvard to Tsinghua University and CERN.

Future Mobility Lab is a new cutting-edge lab in the field of Smart Mobility. In the lab we investigate the potential and impacts of innovations and New Mobility forms on transportation systems and urban environment with an explicit focus on large-scale complex systems, transport-environmental policies, future/automated mobility solutions, and equity. For this purpose, we develop and use state-of-the-art methodologies in behavioral models, simulation, data collection, and analytical tools. For more information see: <https://futuremobilitylab.sites.tau.ac.il/>

Project Overview

Research into autonomous vehicles (AVs) is crucial due to their transformative potential in road transportation. With significant investments and technological advancements, AVs promise to make transport systems safer and more accessible. They can reduce traffic accidents, lower emissions, and improve mobility for the elderly and disabled. However, AVs also pose challenges, such as increasing vehicle kilometers travelled and urban sprawl, which could negate environmental benefits and raise overall energy consumption due to convenience and altered mobility patterns. This project aims to support the holistic assessment of the energy consumption impacts of different autonomous vehicle (AV) implementation strategies in various urban environments. Various operational strategies will be examined, such as robotaxis, on demand shuttles, and high-frequency buses with a fixed route. Apart from tank-to-wheel energy consumption, this project will also investigate the energy required to power the computational tasks, for the sensing equipment, and data transmission and storage, which enable automation. Furthermore, depending on the availability of data of sufficient quality, also the energy savings linked to a reduced number of road accidents will be included, in order to account for a wide variety of indirect impacts.

Responsibilities

The specific responsibilities will involve:

- Contribute to the development and implementation of behavioral and optimization models (e.g., demand generation, tour creation, fleet optimization).
- Solve abstract complex problems/ideas and convert them into useable algorithms/software modules.
- Work with other research scientists to turn transport models into working code, involving the design, implementation, and testing of the models and code.
- Data preparation and analysis
- Work with the researchers on publishing research papers.

Requirements

- Masters in Transportation, Engineering, Operations Research, Applied Mathematics, Quantitative Environmental Modelling, Automotive, Energy or related field
- General knowledge of Transportation Systems
- Programming skills
- Data analysis and data preparation skills
- Quantitative methods used in exact science, such as Statistics and Modelling
- Independent and self-motivated, yet able to work as part of a multidisciplinary team
- Demonstrated ability to effectively manage concurrent technical tasks with competing priorities
- Proficient verbal and written communication skills in English
- Willingness to learn

Preferential advantages:

- Knowledge of Python and SQL
- Relevant experience in the transport or automotive engineering field
- Experience using transport simulation software
- Able to work with GIS programs, especially QGIS

Duration and financing

- The candidate is expected to complete a PhD at Tel Aviv University. The doctoral degree is granted after writing a doctoral thesis, which is typically based on the student's scientific publications, and a public defense.
- The PhD studies take approximately 4 years. During this period at least 6 months will be spent at the Joint Research Center, Ispra, Italy as visiting scientist. The beginning of the training is expected to be carried out at the Joint Research Center. Detailed arrangements will be negotiated with the selected candidate.
- Tel-Aviv University offers international students housing, and Israel has a comprehensive health and social security system. Tel Aviv University's proximity to the artistic and commercial capital of Israel allows students to absorb the best of Israeli culture and society. English is spoken everywhere. For more information about living in Tel-Aviv: <https://en-environment.tau.ac.il/International/City>
- JRC offers visiting scientists housing and the access to a wide range of state-of-the-art world-class experimental facilities. The JRC Ispra site is located in the North of Italy, in the proximity of Lake Maggiore and 70km away from Italian economic capital, Milan, the scenic Italian Alps. The visiting scientist will have the possibility to practice a wide variety of sport and leisure activities in the Ispra area.

To Apply

Interested applicants should submit their full CV/resume, a 1-page cover letter, and a list of three referees, compiled in a single PDF document, to Dr. Bat-hen Nahmias-Biran (bathennb@tauex.tau.ac.il) by **5 January 2025**. We regret that only shortlisted candidates will be notified.