

Online: KIOS Seminars Series Teams



## **KIOS Seminar Series**



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## ORIGIN-DESTINATION MATRIX ESTIMATION IN THE PRESENCE OF FAULTY MEASUREMENTS

## **SEMINAR ABSTRACT**

Estimation of origin-destination (O-D) matrices, i.e. counting the number of trips from a given origin to a given destination, is an important and challenging task that can effectively support transport studies and the development of smart cities. The main objective of the estimation procedure is to calculate an O-D matrix based on available sources to reproduce the field data as accurately as possible. A significant complication when using information obtained from traffic sensors, is that sensors deployed in the traffic network are subject to considerable disruptions that affect the quality and reliability of the information delivered. Despite the extensive study of efficient O-D matrix estimation in the literature, there is no research work that assumes faulty traffic sensors. The path-based cell transmission model (CTM) is utilised to capture the dynamics of traffic networks in a pre-specified time window and associate link densities with per path densities and the path demand. The problem is formulated in an optimisation framework by (i) not taking into account faulty sensors and (ii) taking into account the presence of faulty sensors. The methodology is tested on a sample network and shows great potential in terms of O-D matrix estimation in the presence of faulty measurements. Simulation results underpin the advantage of the proposed approach in terms of performance in estimating quantities of interest as well as identifying the faulty sensors and their fault characteristics.

## **BRIEF BIO**

Yiolanda Englezou is a postdoctoral researcher at KIOS Research and Innovation Centre of Excellence, University of Cyprus since 2018. In 2020 she was awarded a prestigious Marie Sklodowska Curie (MSCA) Widening Fellowship to work with Professors Christos Panayiotou and Stelios Timotheou on the project ``BITS". She received her PhD in Statistics from the University of Southampton in 2018. Her research was within the field of design of experiments, focussing on the development of methods for designing experiments for the calibration of physical and computational models, for example models derived from underlying scientific knowledge. The work was funded by the UK Engineering and Physical Sciences Research Council and, for a time, the UK Atomic Weapon Establishment. She has also completed a degree in Applied Mathematics and Physical Sciences from the National Technical University of Athens in 2014, where she studied Mathematics, Physics and Computer Science, specialising in the areas of Applied Mathematics and Statistics.



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