International Traffic Safety Data and Analysis Group

International Transport Forum
Transport Research Committee
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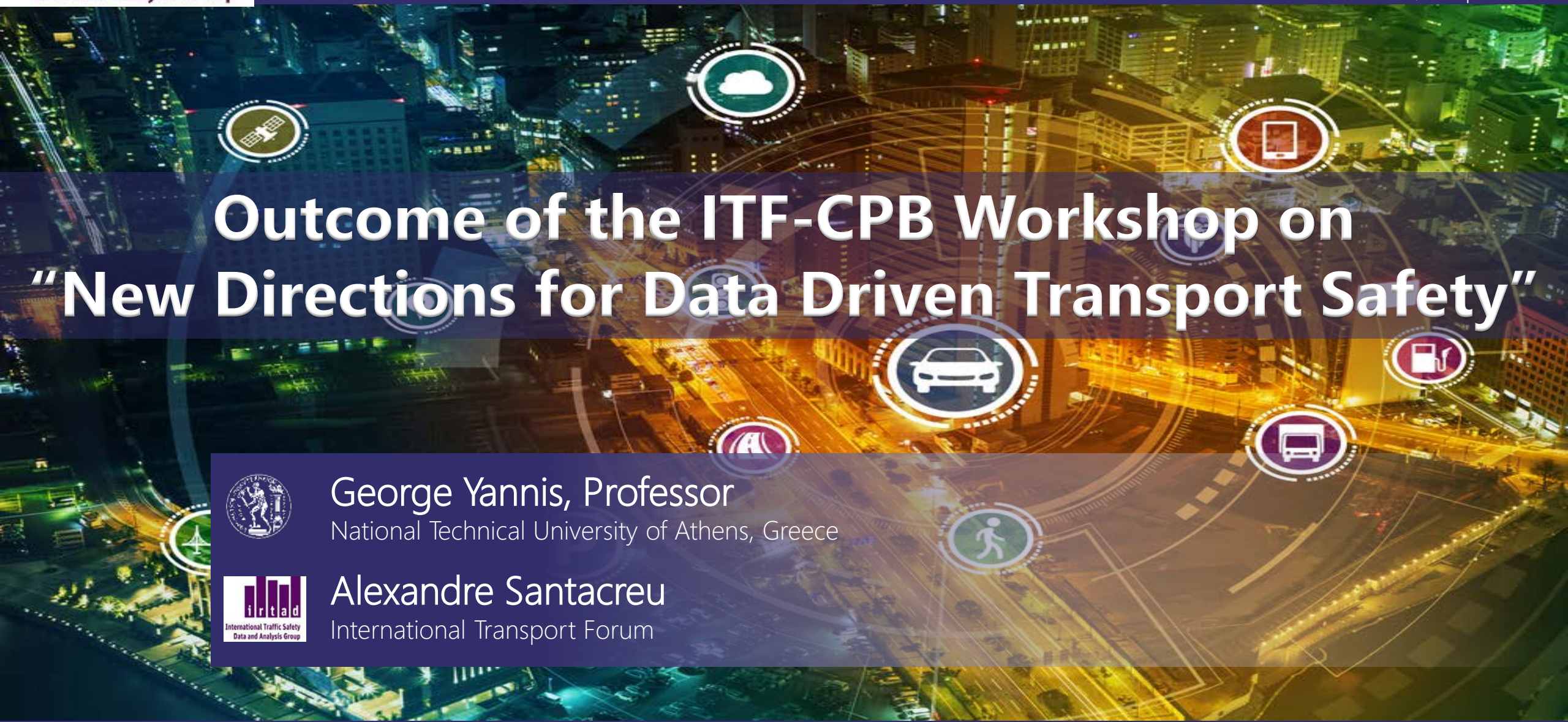


Outcome of the ITF-CPB Workshop on "New Directions for Data Driven Transport Safety"

George Yannis, Professor
National Technical University of Athens, Greece

Alexandre Santacreu
International Transport Forum

Background

- Road transport is responsible for the overwhelming majority of transport fatalities, with an annual 1,35 million road traffic deaths worldwide.
- Innovative data-driven solutions could contribute to a different approach to road safety.
- The rise of smartphones, sensors and connected objects offers more and more transport data.
- The interpretation of these data can be made possible thanks to progress in computing power, data science and artificial intelligence.

Methodology

- ITF CPB Workshop "New directions for data-driven transport safety" held on 3-4 December 2018 at the OECD in Boulogne, France.
- Within the context of a project initiated and funded by the International Transport Forum's Corporate Partnership Board (CPB).
- Led by the ITF, work is carried out in a collaborative fashion in working groups consisting of CPB member companies, external experts and ITF staff.

Objective

- How transport safety will benefit from innovations in data collection, sharing and analysis.

- Explore emerging solutions to:
  - better understand crash outcomes and contributory factors,
  - address infrastructure problems in a proactive manner,
  - address road user behaviour and errors and
  - benefit from driver assistance systems and cooperative connected solutions.

Workshop Findings

Need for New Data

- Reliable data on road crashes and injuries are missing worldwide.
- A core principle of a Safe System is that crash risk is understood and addressed proactively, which is where data plays a central role.
- In order to address road safety problem in a proactive manner, surrogate safety metrics based on the occurrence and severity of relevant traffic conflicts could play a significant role.
  - evasive action, such as e.g. braking, swerving
  - "close calls" by the use of AI in video analytics

Gathering Intelligence on Crashes and Injuries (1/2)

- Automatic data collection is possible through instrumented floating vehicles and/or smartphones reporting information along the way.
- Active safety systems can also be considered among surrogate safety metrics (e.g. ABS, ESP, AEB).
- Technologies like automatic crash notification and event data recorders propose data-driven responses to post-crash problems.

Gathering Intelligence on Crashes and Injuries (2/2)

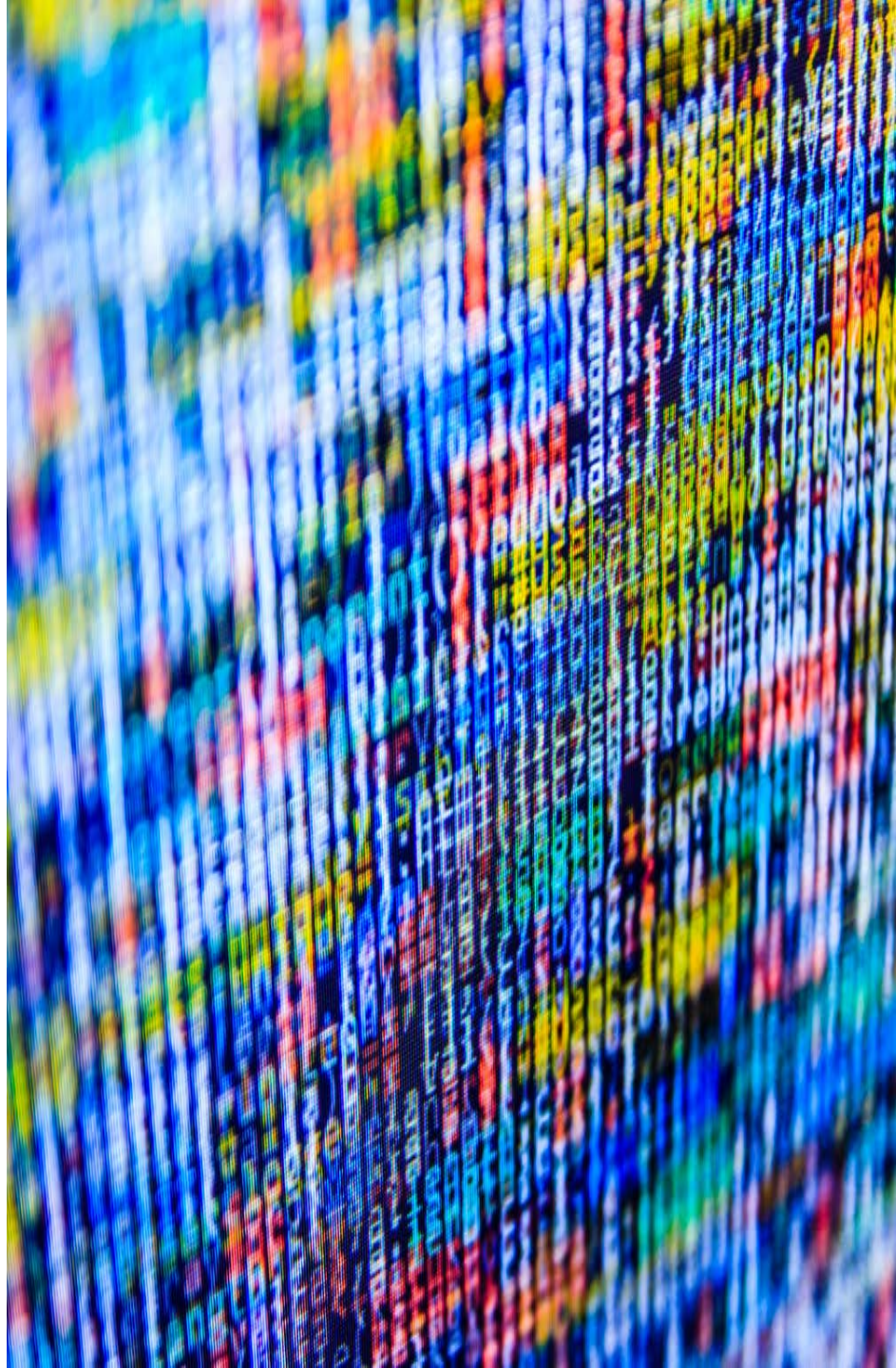
- Street imagery, also collected by floating vehicles, supports the assessment of road safety performance (star-rating for roads).
- Drones and satellites complement the range of data, capture solutions and play an increasing role.
- Telematics solutions exist for fleet management, usage-based insurance, eco-driving and safe driving coaching, with smartphones being popular in these applications.

Cooperative-Intelligent Transport Systems

- Cooperative ITS (C-ITS) technology will enable connected vehicles to openly broadcast not only their position regularly but also warning messages.
  - Talk to each other
  - Report on the system performance in real time
- C-ITS have been developed mainly by and for the automotive industry.
- There is a risk that C-ITS do not contribute to the improvement of VRUs' safety.

Technology Weaknesses

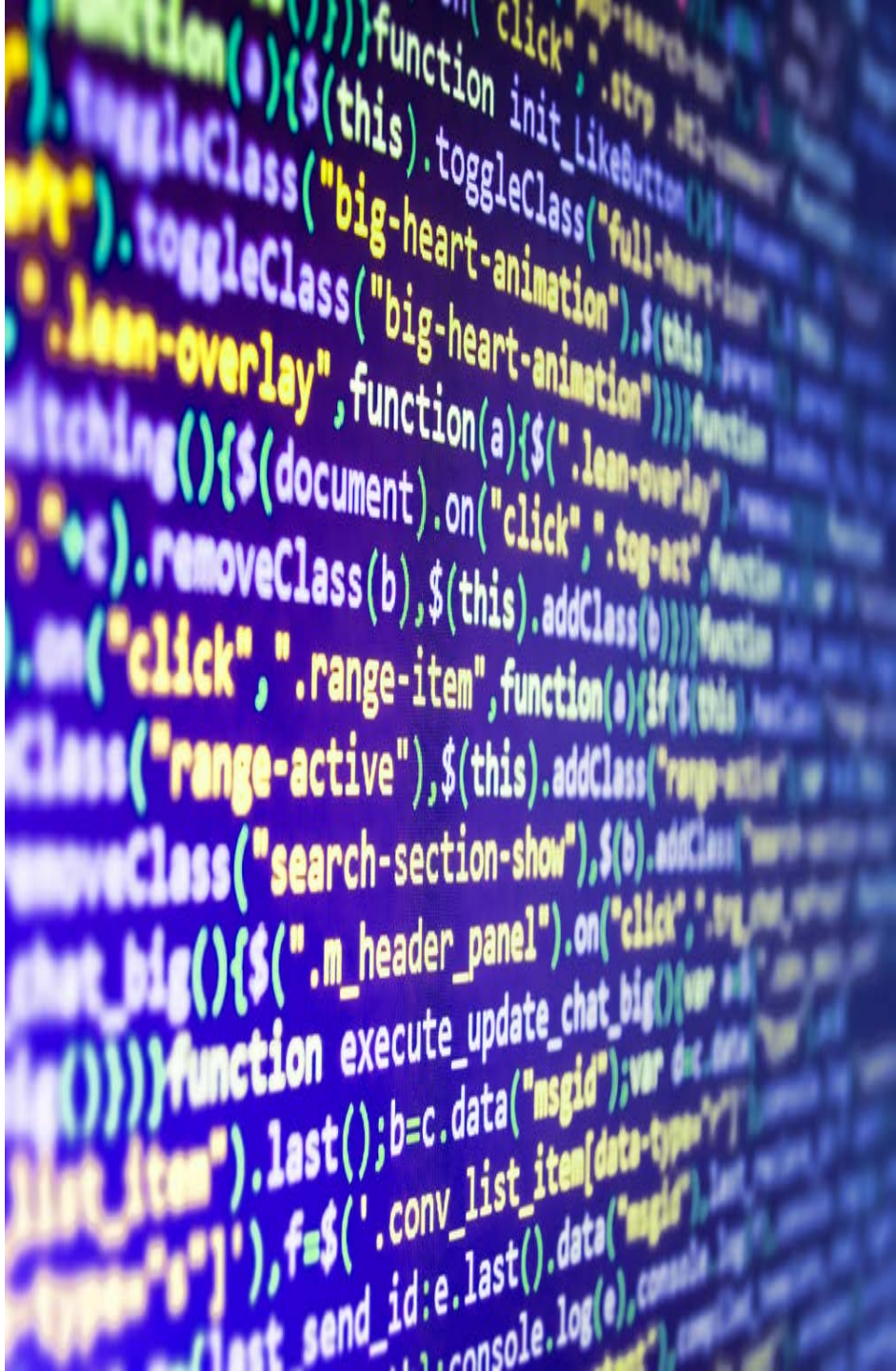
- Big Data is not only prone to many of the same errors and biases in smaller data sets, it also creates new ones.
- Big data creates privacy threats, especially with the risk of re-identification of individuals in datasets.
- Drivers using social driving apps may be distracted by new services (navigation, coaching, C-ITS alerts, infotainment, etc.).



Recommendations

A Platform and a Standard for Vehicle Data Collection

- Requirements on data collection should be imposed on shared vehicles.
- Standard data reporting formats should be established, to facilitate the processing, de-identification and most meaningful analysis of the data submitted by various operators.
- An international data standard could also be beneficial to operators.
- The platform should include traffic volumes in order to account for any bias in the use of connected vehicles.



Vehicle Telematics Data

- Vehicle telematics could have significant effects on driver behaviour.

- It is recommended that vehicle data should be available wirelessly for telematics applications:
  - Establish a new standard for the wireless dissemination of vehicle information, e.g. through existing on-board entertainment connectivity
  - ABS/ESP/AEB activations for third party apps, that monitor driving conditions, should be included in this protocol.

- The protocol should be designed as a one-way broadcast, in order to eliminate hacking risk.

Big Data versus Big Biases

- Every data set should be considered biased towards some user groups, trip purposes or in any other dimension.
- The consequences of using data which isn't representative of the whole population should be assessed.
- There is a high risk for decision makers to be misled by the opportunistic analysis of seemingly low-cost data in absence of qualified data scientists and statisticians.

Research Topics

- Conduct research on the validation of surrogate safety metrics:
  - to reveal which metrics not only are correlated with reported crashes but also have predictive capabilities
  - predict the number of people killed and seriously injured
  - how surrogate safety metrics should include crash participant fragility, speed, mass and crash angle
- The adoption of surrogate safety metrics leads to the review of statistical training needs, so that data are not misused.
  - Urgent links should be created with academic partners
- Support research and innovation in the area of crash reporting:
  - Self-reported traffic injury surveys could play a role in complementing other datasets.

Use of Technology to Benefit All Road Users

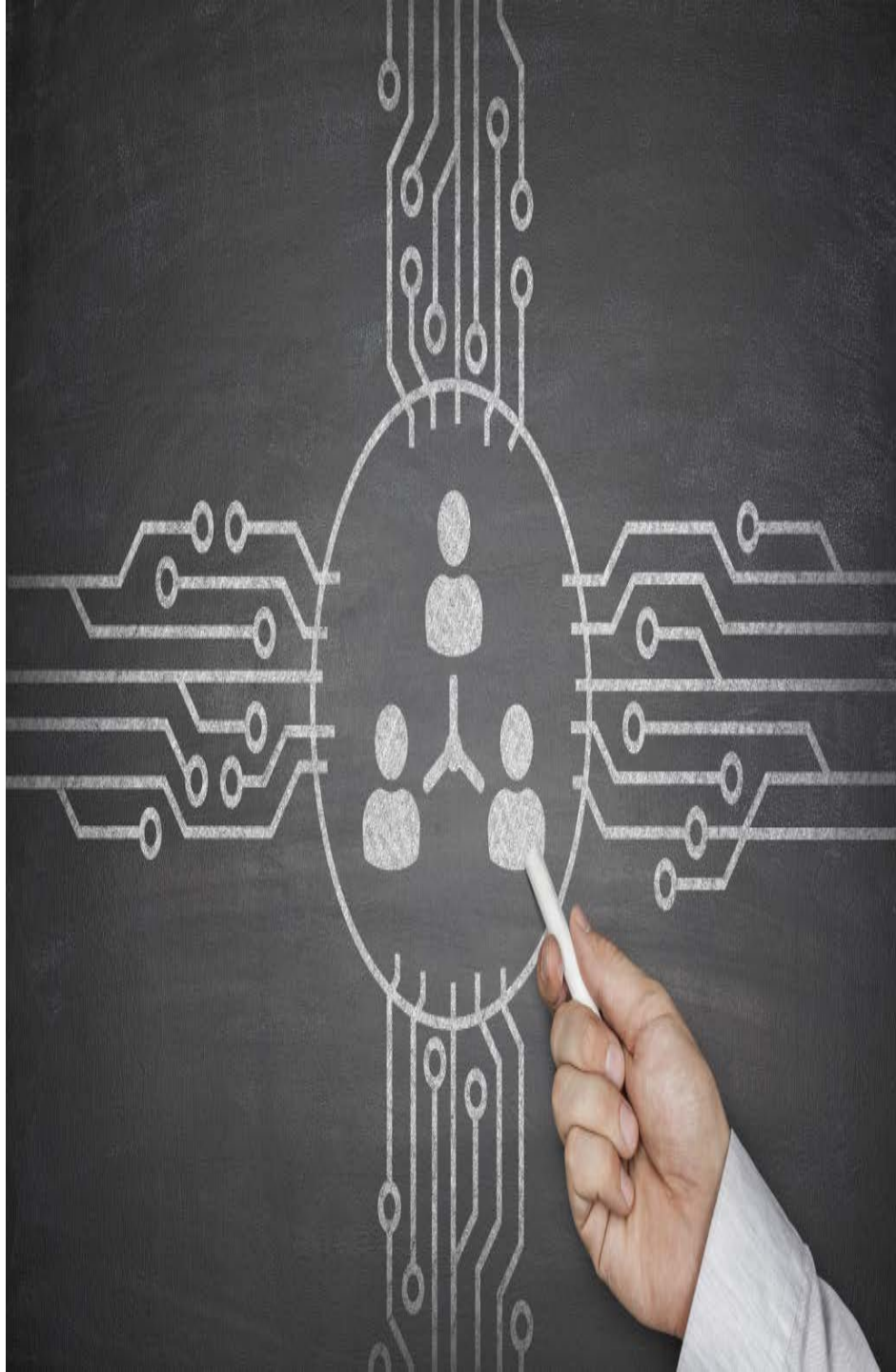
- Cooperative ITS technology will enable every vehicle to openly broadcast its position regularly and to broadcast warning messages when relevant.
- In order to benefit the wider community, including non-connected vehicles, smartphones could be integrated in the C-ITS eco-system, so they are used as receivers.
- Policy makers should also allocate frequency bands for C-ITS safety application.
- Revise trigger mechanisms for automatic crash notification (e.g. e-Call) or event data recorder (EDR) systems, so that VRUs will also benefit from them.

Driver Behaviour

- New vehicles should include distraction and drowsiness alerts as standard.
- Crash investigators should have access to eye tracking data through event data recorders.
- Smartphone apps developed by insurers should prevent drivers from using the phone.
- Share data to cap driving hours in the gig economy.
  - Ride-sourcing and delivery platforms sharing data on driving and riding time via the licence number for preventing gig economy sector from breaking the driving hours restrictions.

Feedback Reporting Systems

- Empower transport users and workers through feedback reporting systems, by maximizing participation.
- Transport workers should have a trusted channel where to report issues.
- Passengers should be able to contribute to identifying risky behaviours in the bus and taxi industries.
- A platform should exist for road users, in order to submit evidence of unsafe driving or road defects.
- Highway authorities should join forces and provide such platforms, harmonise user experience, share some of the costs and consider open-source solutions.



Privacy Protection

- Explicit guidelines should be available to stakeholders concerning the protection of personal data, but also to offer reassurance on the legality of data collection and analysis.
- The use of strong de-identification techniques, data aggregation and encryption techniques are critical.
- Issues concerning video images used for close call analysis should be addressed.

New Data Sharing Partnerships

- New data ownership frameworks will be developed along the lines of "A New Deal on Data".
- Partnerships enabling both the private and public sector can be created.
  - Work is required to define the scope and scale of data collection that is in line with public mandates.
- Open source or commercial solutions are developed to collect, harmonise and aggregate mobility data.
- It is suggested that stakeholders make road safety data freely available through such platforms.

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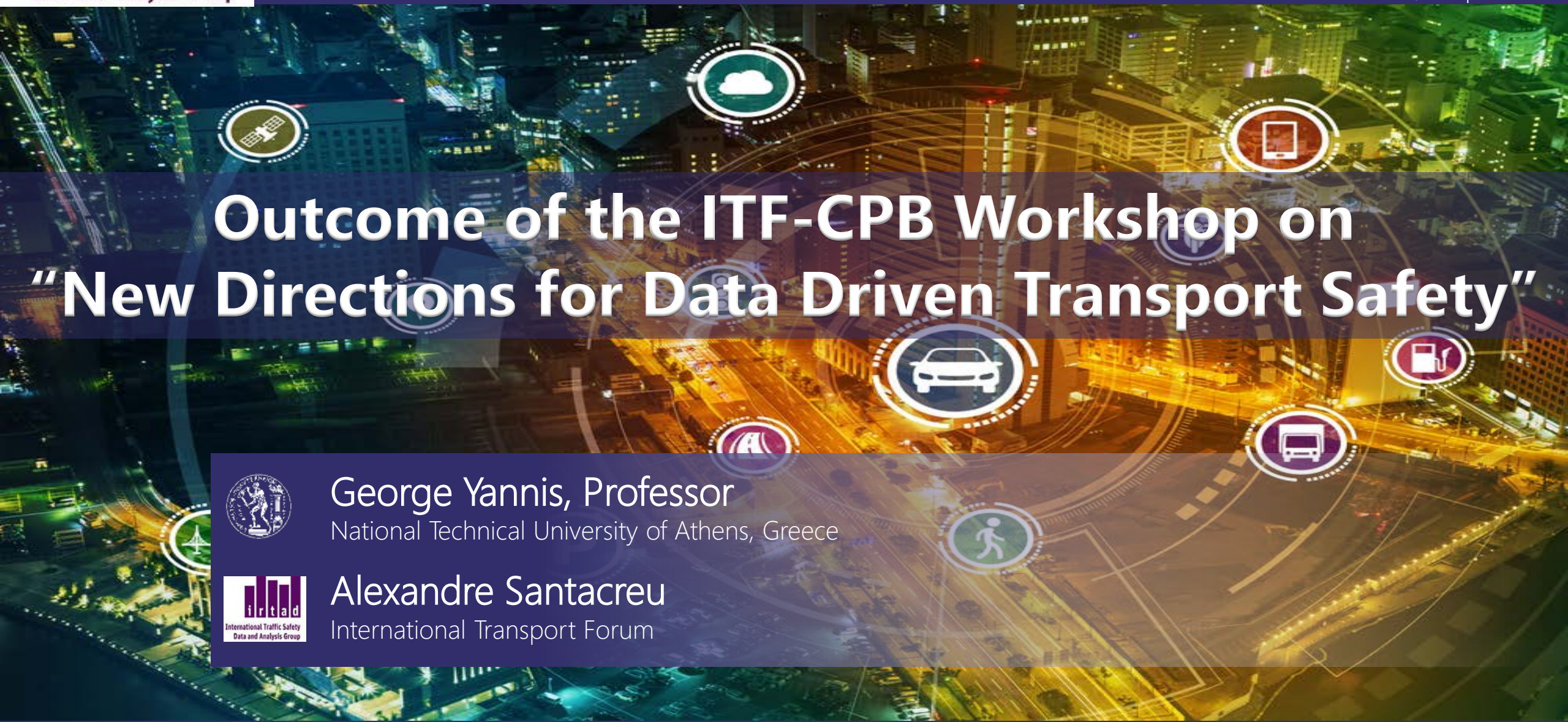

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