



NATIONAL & KAPODISTRIAN UNIVERSITY OF ATHENS

Smart multimodal eco-mobility and AI based energy incentives



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Our Profile and Focus

General Profile

- National & Kapodistrian University of Athens (UoA, uoa.gr) – the oldest and with the first ranking among all Greek Universities
- We form a research and innovation unit in Department of Informatics & Telecommunications (DIT, di.uoa.gr): Software Centric & Autonomic Networking Lab (SCAN, scan.di.uoa.gr)
 - 20 **researchers, engineers** and support personnel
 - **More than 20 EU Funded Projects** (since FP6)
 - SCAN-NKUA coordination (both PM and TM) in several of them
 - **More than 10 Industry Contracts**
 - Several **patents** filed in European Patent Office,
 - More than 500 **publications**,
 - More than 4000 **citations**,
 - Support of BSc/MSc/PhD dissertation thesis: ~15 per year.

Focus Areas

- Internet of Things – Smart Cities – Connected Cars
- Smart Grids
- Mobile/Wireless Communications (5G, LTE)
- MEC - Cloud
- Software-Defined Networks (SDN) - Network Function Virtualisation (NFV)
- Big Data (Data Analytics, Predictive Analytics, Data Economy)
- Next Generation Internet



EU & Industry Projects

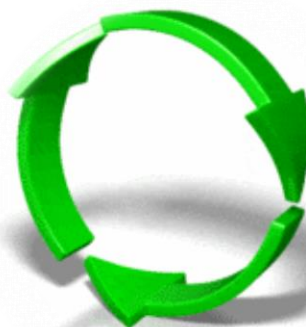
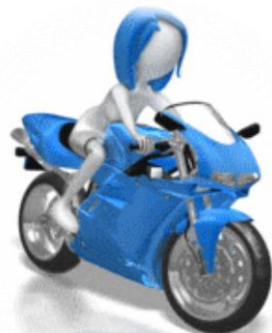


Smart eco-mobility

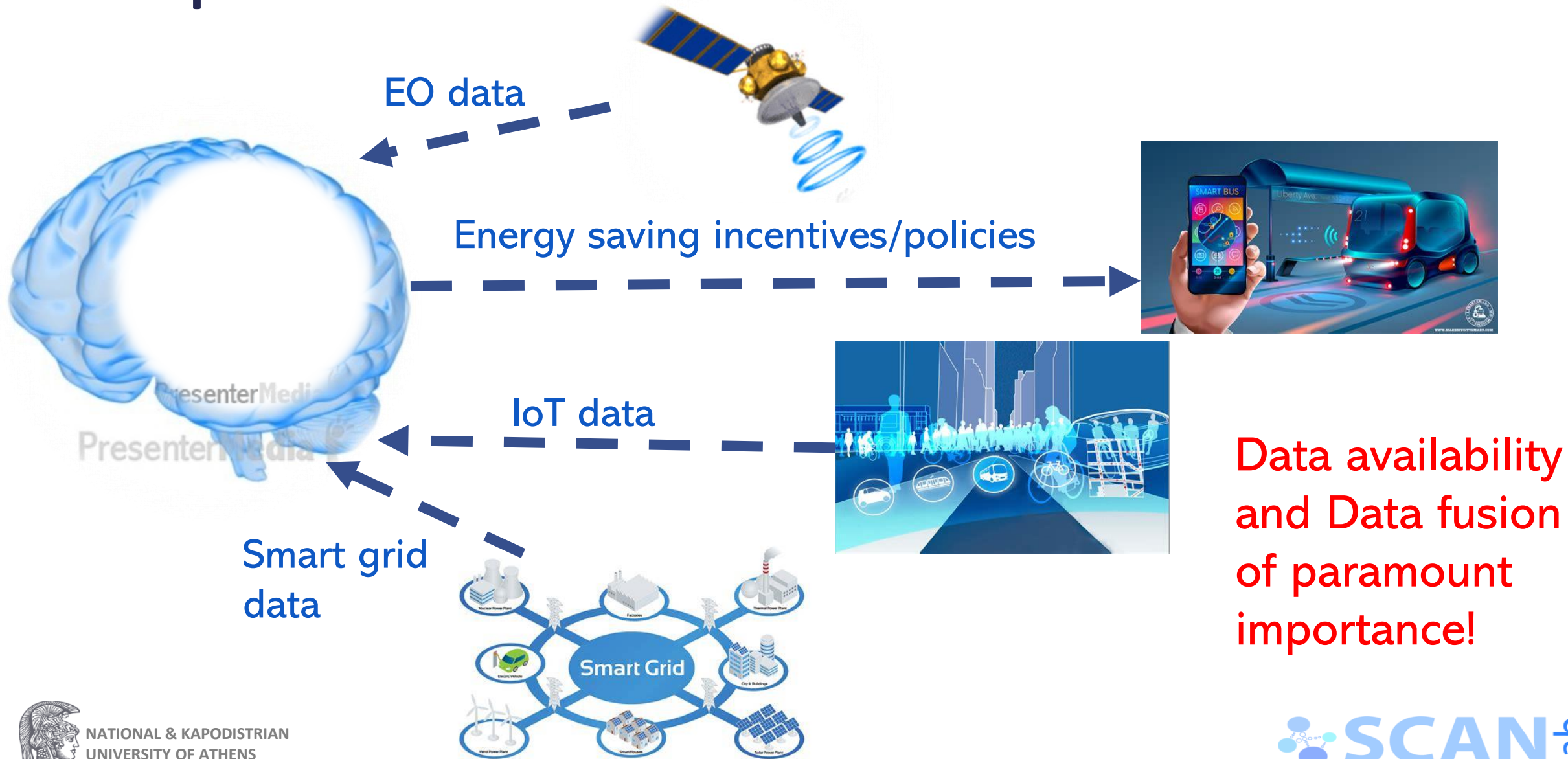
- In short, it is a public transportation system which incorporates advanced technology to bolster the cities' ability to withstand the winds of change. These technologies can include the use of demand data, optimisation algorithms, distributed cloud computing and Artificial Intelligence (AI).
- Information related to the demand for public transport, such as where people need to go, when do people need to get there, and how does demand change throughout the day. Combined with energy needs and demands, it can affect route planning, with smart transport systems using the demand data to ask about the energy resources that could meet people's needs and assess potential optimization.



One step at a time.....



AI and Data analytics for smart eco-mobility- boosting on-time performance



What are the gains?

- A real time monitoring framework to track multimodal transportation and mobility related energy consumption
- Create awareness for energy optimization in mobility patterns and behaviours
- Understand the costs and trade-offs involved in terms of transport mode and energy consumption, per route, per mode selection, per time etc.
- Predict energy requirements and savings (e.g., use of electric vehicles in combination with legacy transport infrastructure)
- Update policies based on real data
- Provide incentives for optimized multimodal transportation
- Smart public transport - Energy positive city transportation
- Experiments have shown a 17% energy reduction on overall city transportation



More benefits if the use of alternative energy is promoted as a real time service...

- Real time monitoring of the energy network and grid
- Real time awareness of the sources of power in the network and the targeted consumption areas
- Create consumer awareness of the eco-friendly energy availability
- Create real time incentives for alternative energy usage in city transport and homes
- Increase use of alternative energy sources by 15%
- The energy industry, the state and cities, the public transportation industry must not let the mobility revolution pass them by



AI-based platform for energy aware smart eco-mobility

- Energy based multimodal transport route planning
- Notifications to users for the foreseen energy gains
- Notifications related to the alternative energy sources availability in the power supply
- Incentives for optimizing user mobility patterns based on energy-awareness
- **Sustainable mobility. E-mobility increasingly powered by renewable energy will be a central component of a smart and resource-friendly urban lifestyle**



Thank you!

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