## Special Session
## Network resilience under disasters

**Description:**
This special session aims to provide understanding, designing, and improving the robustness and recovery capabilities of critical infrastructure networks when faced with environmental hazards and disasters. This field examines how natural events such as earthquakes, floods, hurricanes, wildfires, and other extreme weather conditions impact the functionality of communication, transportation, energy, and water networks. Researchers aim to develop strategies and technologies that enhance the ability of these networks to withstand, adapt to, and quickly recover from such disruptive events. We concentrate on:

- Risk Assessment and Vulnerability Analysis: Identifying potential hazards and assessing the vulnerability of network components and connections to these hazards.
- Resilience Engineering: Designing and implementing infrastructure with built-in resilience features that can absorb shocks and maintain functionality during disasters.
- Redundancy and Diversity: Ensuring multiple pathways and alternative resources within networks to prevent single points of failure and enhance recovery options.
- Real-time Monitoring and Response: Developing systems for real-time data collection, monitoring, and automated response to mitigate the impact of disasters.
- Recovery Planning and Resource Allocation: Establishing protocols for efficient resource distribution and repair processes post-disaster to expedite recovery.
- Simulation and Modeling: Using computational models to simulate disaster scenarios and predict their impact on networks, helping to formulate effective response strategies.

**Session Moderator**:

- Dr. Konstantinos Kokkinos, Senior Lecture and Researcher, Energy Systems Dept., University of Thessaly, Greece.
- Prof. Dr.-Ing. Nicholas Samaras, Digital Systems Dept., University of Thessaly, Greece.

**Topics and Presenters**:
*The first mentioned person will be the presenter*

**RES-Q: A Holistic Approach to Semantic Orchestration and AI-Enhanced Mobility in Disaster Response**

- Omiros Iatrellis, Dept. of Digital Systems, University of Thessaly, Larissa, Greece
- Nicholas Samaras, Dept. of Digital Systems, University of Thessaly, Larissa, Greece
- Areti Bania, Dept. of Digital Systems, University of Thessaly, Larissa, Greece
- Konstantinos Kokkinos, Dept. of Digital Systems, University of Thessaly, Larissa, Greece

**FiReS: An Advanced System Utilizing Semantic Technologies and AI for First Responders in Post-Disaster Plans**

- Areti Bania, Dept. of Digital Systems, University of Thessaly, Larissa, Greece
- Omiros Iatrellis, Dept. of Digital Systems, University of Thessaly, Larissa, Greece
- Nicholas Samaras, Dept. of Digital Systems, University of Thessaly, Larissa, Greece

**Quantitative Dynamic Flood Monitoring and Forecasting using Satellite and Aerial Images: the Use Case of Larissa, Greece.**

- Maria Drogkoula, Dept. of Digital Systems, University of Thessaly, Larissa, Greece
- Konstantinos Kokkinos, Dept. of Digital Systems, University of Thessaly, Larissa, Greece
- Omiros Iatrellis, Dept. of Digital Systems, University of Thessaly, Larissa, Greece

- Nicholas Samaras, Dept. of Digital Systems, University of Thessaly, Larissa, Greece

**Low Carbon Transformation and Resilience Decision Support System via DEMATEL and FCM**
- Konstantinos Kokkinos, Dept. of Digital Systems, University of Thessaly, Larissa, Greece
- Omiros Iatrellis, Dept. of Digital Systems, University of Thessaly, Larissa, Greece
- Nicholas Samaras, Dept. of Digital Systems, University of Thessaly, Larissa, Greece

**The Smart Transport as a part of Smart Cities: a "START-UP" Project Survey of Training Needs**
- Velizar Petrov, University of Agribusiness and Rural Development, UARD, Plovdiv, Bulgaria

**Integrating Sustainable and Resilient Supply Chains with Modern Business Models for Sales and Customer Relationship Management**
- Vasko Vasilev, University of Agribusiness and Rural Development, UARD, Plovdiv, Bulgaria

**Digital Twin of an Electric Bicycle Using Smartphone Sensors and Weather Data**
- Onoufrios Haralampous, Dept. of Digital Systems, University of Thessaly, Larissa, Greece
- Nicholas Samaras, Dept. of Digital Systems, University of Thessaly, Larissa, Greece

*Moderators……………………………………………………………………………………………………………………..*

**Dr. Konstantinos Kokkinos**
Dr. Kokkinos holds a B.Sc. in Physics, from Univ. of Thessaloniki, Greece, a M.Sc. & PhD in Computer Science from UoM, WMU, U.S.A. (1995 and 2002 respectively). He is an IEEE member, an OpenMI-Assoc. member, and currently an Assistant Professor of the Digital Systems Dept. at Univ. of Thessaly, Greece. His major research interests include Decision Support Systems, Fuzzy Logic and Soft Computing, Integrated Modelling and Simulation, Artificial Intelligence, and Environmental Software. Dr. Kokkinos has participated in 12 NSF, FP7, Horizon 2020 and Erasmus+ funded projects and has published over 65 papers.

**Dr. Nicholas S. Samaras**
Nicholas S. Samaras (IEEE SM) is a Professor at the Department of Digital Systems, at the University of Thessaly, in Larissa, Greece. Dr. Samaras received his Ph.D. degree from the University of Pittsburgh, in Pittsburgh, PA, USA, in electrical engineering. His current research interests include IoT Systems and Applications, Networked Control Systems and Industrial Automation. He has served in several organizing, Steering and/or Program Committees, for several international conferences and he is Associate Editor and paper reviewer for various International Journals. He was a corecipient of the IEEE Industry Applications Society Prize Paper Award in 1998.

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# FiReS: An Advanced System Utilizing Semantic Technologies and AI for First Responders in Post-Disaster Plans

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**Maria Drogkoula**

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**Dr. Konstantinos Kokkinos**

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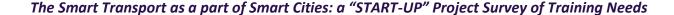
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*The Smart Transport as a part of Smart Cities: a "START-UP" Project Survey of Training Needs*

**Assist. Prof. Eng. Velizar Petrov**

Master's degree in Industrial management, Gabrovo Technical University. Doctoral student, Finance and Banking, Assistant Professor and Lector at University of Agribusiness and Rural Development. 28 years of experience in regional development, business support, consulting, training, national and EU projects. Executive Director of Regional Development Agency with Business Support Centre for Small and Medium-sized Enterprises.

*Integrating Sustainable and Resilient Supply Chains with Modern Business Models for Sales and Customer Relationship Management*

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Graduated with a bachelor's degree in Business Administration at UARD Plovdiv and a master's degree in "Business Communications and Public Relations" at Paisii Hilendarski University of Plovdiv. PHD student in "Economics and Management" at the University of Food Technology in Plovdiv. Assistant Professor in University od Agribusiness and Regional Development teaching Business Communications, Entrepreneurship, Fundamentals of Management, Strategic Management, Human Resources Management.

## *Digital Twin of an Electric Bicycle Using Smartphone Sensors and Weather Data*



**Dr. Onoufrios Haralampous**

Onoufrios Haralampous is an Associate Professor at the Department of Digital Systems, at the University of Thessaly, in Larissa, Greece. Dr. Haralampous received his Ph.D. degree from the School of Mechanical Engineering, Aristotle University of Thessaloniki, Greece. He specializes in heat and mass transport phenomena and their applications in exhaust aftertreatment systems. His research interests include digital twins and environmental applications of digital systems. He has coauthored more than 30 scientific papers in international journals and conferences, one of which was selected by the Society of Automotive Engineers (SAE) for the "Arch T. Colwell Merit Award" in 2004.



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