

# PANAYIOTIS KOLIOS

PhD, BEng, AKC

## Webpage

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## PROFILE

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Panayiotis Kolios received his BEng degree in Telecommunications Engineering from King's College London in 2008. He then joined the Centre for Telecommunications Research at King's College as a PhD student, funded by an EPSRC DTA scholarship. During his doctoral training studies, he worked on energy efficient wireless networking architectures; contributing to the Mobile VCE Green Radio project. He was awarded the Ph.D. degree on January 1st, 2012.

Subsequently he joined the Department of Communications and Internet Studies at the Cyprus University of Technology where he conducted research on the development of terrestrial maritime communications as a low-cost alternative (to satellite links) solution to support Internet-like services over the sea. He then joined the Department of Computer Science (CS), University of Cyprus (UCY) as a visiting lecturer teaching both undergraduate and postgraduate courses on systems and networks, programming and introductory courses on computer science. At the same time he conducted research on ad-hoc device-to-device communications.

In June 2013 he joined the KIOS Research and Innovation Centre of Excellence of the University of Cyprus where he is currently a Research Assistant Professor. His work focuses on both basic and applied research on networked intelligent systems. Some examples of systems that fall into the latter category include intelligent transportation systems, autonomous unmanned aerial systems (i.e., drones) and the plethora of cyber-physical systems that arise within the Internet of Things. Particular emphasis is given to emergency management in which natural disasters, technological faults and man-made attacks could cause disruptions that need to be effectively handled. Tools used include graph theoretic approaches, algorithmic development, mathematical and dynamic programming, as well as combinatorial optimization. He has successfully secured multi-million research and industrial funds that have been invested in the aforementioned research and innovation activities within the KIOS Center of Excellence.

Over the years, Panayiotis served as a visiting researcher at the Department of Informatics, King's College London, and the Department of Mathematics, London School of Economics and Political Sciences. As of late, he has also built strong collaborations with the Institute of Security Science and Technology at Imperial College London.

## EDUCATION

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### King's College London, University of London

*Sept 2008 - Sept 2011*

- PhD Telecommunication Research
- Member of the Centre for Telecommunications Research
- Member of MobileVCE

### King's College London, University of London

*Sept 2005 - Jun 2008*

- BEng in Telecommunication Engineering
- Overall grade: 92.7%
- Associateship of King's College (AKC)
- Student representative at King's College London
- Student representative for the IEEE Engineering Society
- 3<sup>rd</sup> year graduated ranking 1<sup>st</sup>

*Sept 2007 - Jun 2008*

Received: Jelf and KCLEA medals,  
King's College Engineering Society Centenary Prize,  
Layton Science Research Award,  
Siemens Prize

- 2<sup>nd</sup> year ranked 1<sup>st</sup> *Sept 2006 - Jun 2007*  
 Received: Siemens Prize,  
 Advanced Transferable Skills best new idea award
- 1<sup>st</sup> year ranked 2<sup>nd</sup> *Sept 2005 - Jun 2006*  
 Received: Jameson Prize
- Army, Cyprus** *July 2003 - Aug 2005*
  - Signal Corps  
 Wireless communications engineer  
 National Guard General Staff headquarters  
 Rank: Sergeant
  - Trained in military Communication Systems
- The Grammar School, Nicosia** *Sept 1996 - Jun 2003*
  - Pure and Applied Sciences  
 Secondary Education Degree  
 General average: 92.67%
  - Student Prefect

## HONORS AND AWARDS

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- Invest Cyprus Innovation Awards** Dec 2020  
*Public Sector* *Cyprus*
  - Recipient of the Invest in the Commercialization of Entrepreneurship award from Invest Cyprus for the entrepreneurship activities made in the use of autonomous drone-based security applications.
- ETEK Engineering Award** Oct 2020  
*Public Sector* *Cyprus*
  - Recipient of the ETEK Engineering Award honourable mention for the work on the “COVID-19 Emergency Response Management Platform”, the web-based platform which manages all the national data related to the COVID-19 pandemic in Cyprus. The Platform was developed by KIOS for the Ministry of Health, in collaboration with the Deputy Ministry of Research, Innovation and Digital Policy.
- IEEE Intelligent Transportation Systems Conference** Sept 2020  
*Best Paper Award* *International*
  - Best Paper Award for the work by E. Rigas, P. Kolios, and G. Ellinas, “Extending the multiple travelling salesman problem to schedule drones for monitoring missions”.
- Employers & Industrialists Federation (EIF) Cyprus Innovation Awards** Dec 2019  
*Public Sector* *Cyprus*
  - The Innovation Award in the Public Sector was awarded for the creation of the innovative SwiftTag software. SwiftTag aims to automate drones in search and rescue operations.
- IEEE Regional Exemplary Student Branch Award** Sept 2019  
*Student Branch Award* *IEEE Region 8*
  - Counselor of the IEEE University of Cyprus Student Branch that received the 2019 Exemplary Student Branch Award from IEEE across Region 8 (Europe, Middle East and Africa).
- Honorary Diploma** June 2018  
*Course Instructor* *DG ECHO UCPM AMC*

- Received the Honorary Diploma from the organizers of the Assessment Mission Course of the Union's Civil Protection Training Programme for the training carried out over the last 3 years on the Use of Drones for Needs Assessment in Emergency Response.

#### **Best IEEE Student Branch**

*Winning Team*

March 2018

*IEEE Region 8*

- Counselor of the IEEE University of Cyprus Student Branch that won the best performing Student Branch award from IEEE across Region 8 (Europe, Middle East and Africa).

#### **KPMG Cybersecurity event**

*Winning Team*

Oct 2017

*Nicosia, Cyprus*

- Supervised a team of 3 researchers (Petros Petrides, Filokypros Iouliauou, Odysseas Economides) which won the Capture the Drone Game; part of the Cyber security conference hosted by KPMG Cyprus.

#### **International Conference on ICT for Disaster Management**

*Best Paper Award*

Nov 2015

*International*

- Konstandinos Koumidis, **Panayiotis Kolios**, Christos Panayiotou, and Georgios Ellinas, "ProximAid: Proximal adhoc networking to Aid emergency response".

#### **IEEE ComSoc "Communications Technology Changing the World"**

*Honor*

2015

*International*

- ProximAid: Proximal adhoc networking to Aid emergency response
- The project developed an Android app to enable peer-to-peer adhoc communication. On top, a distributed localization mechanism has been implemented to pinpoint entities (including people and resources) in the locality of each user's geography. Different entities are presented on a map together with additional information to build a situational map for decision support.

#### **2nd International Competition of the EU COST Action "ARTS: Towards Autonomic Road Transport Support Systems"**

*2<sup>nd</sup> Place Award*

Oct 2015

*Bordeaux, France*

- Autonomic fault-adaptive traffic state estimation and sensor-fault detection in road traffic systems

#### **Cyprus Digital Championship**

*1<sup>st</sup> Place Award*

Nov 2014 - June 2015

*Cyprus*

- ProximAid: Proximal adhoc networking to Aid emergency response
- The project developed an Android application that can be installed on smartphones to enable device-to-device communication. Moreover, intelligent solutions have been developed to enable adhoc networking between the participating devices in order to support the exchange of text and multimedia across the connected devices. This technology can serve the needs of all actors involved in disasters whereby the telecommunication infrastructure has been damaged or completely destroyed.

#### **Wireless World Research Forum 25**

*Best Paper Award*

Dec 2010

*UK*

- **Panayiotis Kolios**, Vasilis Friderikos and Katerina Papadaki, "Mechanical Relaying in Cellular Networks".

## **TEACHING EXPERIENCE**

#### **University of Cyprus**

*Research Assistant Professor*

Sept 2019 - Present

*Lefkosia, Cyprus*

- Teaching courses including ECE 807 - 808 Critical Infrastructure Systems Applications I – II (Fundamentals - Advanced), which are part of the MSc program in Intelligent Critical Infrastructure Systems offered by the Department of Electrical and Computer Engineering of the University of Cyprus, in collaboration with the KIOS Research and Innovation Center of Excellence and Imperial College London.

### **University of Cyprus**

*Visiting Lecturer*

Sept 2012 - May 2013

*Lefkosia, Cyprus*

- Taught courses include EPL002 (Introduction to Computer Science), EPL003 (Computer Science and Information Systems) and EPL032 (Introduction to Programming and Problem Solving) which are part of the University's core module structure and EPL657 (Wireless Networks), a postgraduate course offered to Computer Science graduates.
- Supervised 5 undergraduate and 3 postgraduate students.

### **King's College London**

*Teaching Assistant*

Sept 2008 - Sept 2011

*London, U.K.*

- Undergraduate and postgraduate level courses at King's College London; including Random Variables and Stochastic Processes.
- Project supervisor for both undergraduate and postgraduate level students within the Department of Engineering.

## **PROFESSIONAL ACTIVITIES**

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### **IEEE Computational Intelligence Society Drone Training**

*Workshop Instructor*

Sept 2018

*Nicosia, Cyprus*

- Organized and conducted a 2-day workshop on research and innovation activities on drone artificial intelligence technologies. The workshop attracted 20 students from different Universities and academic background.

### **Argentina's Ministry of Security Drone Training**

*Workshop Instructor*

Dec 2017

*Buenos Aires, Argentina*

- Training instructor on the use of unmanned aerial vehicles in emergency management fully funded by the Ministry of Security of Argentina. More than 50 first responder experts have attended the 2-day course which included a theoretical and a practical session.

### **DG ECHO UCPM**

*Course Instructor*

May 2016 - Present

*Limassol, Cyprus*

- Training instructor on the use of unmanned aerial vehicles in emergency management taking place 5 times a year within the AMC (Assessment Mission Course) of the Union's Civil Protection Mechanism Training Programme with estimated attendance of 20 European experts.
- Organizer of the 1st Exchange of Experts workshop on "Drones in Emergency Management" with 17 first responder participants from across 11 European Countries. The 4-day workshop was fully funded by DG ECHO.

### **KIOS Innovation Hub**

*Senior Researcher*

June 2013 - Present

*Lefkosia, Cyprus*

- Lead innovation activities with industry (e.g. Aeolian Dynamics), government organization (e.g. Cyprus Police, Cyprus Fire Service, Cyprus Civil Defence) and regional stakeholders (e.g. KEMEA Greece).
- Supervised 7 Master students and currently co-supervise 6 Doctorate students.
- Principal organizer of the Kios Research Center seminar series (June 2013 - June 2016).

## Conference Organization

2017 - Present

- Co-organized the 24th International Conference on Telecommunications (ICT 2017) with estimated attendance of 250 and targeted acceptance rate of 45% for submitted papers.
- Local organizing committee member of the 17th annual European Control Conference (ECC 2018) with estimated attendance of more than 650 participants from 50 countries and acceptance rate of 48% for submitted papers.
- Local organizing committee member for the 11th IFAC Symposium on Fault Detection, Supervision and Safety for Technical Processes, SafeProcess 2021.

## Cost Action CA15127

Nov 2015 - Present

*Management Committee*

*European*

- Participate in Cost Action “Resilient communication services protecting end-user applications from disaster-based failures (RECODIS)” to provide resilient communications in the presence of disaster-based disruptions (<http://www.cost-recodis.eu/>).

## EENA Working Group on RPAS

Jul 2015 - Present

*Member*

*International*

- Contributor to the EENA Operations Document on RPAS and the Emergency Services.
- Contributor to the EENA Operations Document on Smartcities and Emergency Services.

## Research Promotion Foundation Researchers Week

Sept 2014 - Present

*Contributor*

*Cyprus*

- In 2017, demonstrated drone delivery automations, GIS-based mission planning.
- In 2016, demonstrated Drone-based path planning using Android applications and the online version of ProximAid.
- In 2015, demonstrated Drone-based Object detection and several updates on ProximAid.
- In 2014, demonstrated ProximAid.

## Association and Societal Volunteering

Sept 2008 - Present

*Technical Activities*

*International*

- Active reviewer for several top scientific journals, including: IEEE Transactions on Wireless Communications, IEEE Transactions on Signal Processing, IEEE Transactions on Mobile Computing, IEEE Transactions on Control Systems Technology, IEEE Transactions on Vehicular Technology, IEEE Magazine/Transactions on Intelligent Transportation Systems, IEEE Wireless Communications Letters, Elsevier Computer Networks Journal, etc. Also an active reviewer of several top technical conferences, including: IEEE Global Communications Conference, IEEE Symposium on Computers and Communications.
- Technical Programme Committee member of several major conferences, including: IEEE International Conference on Communications (ICC), IEEE Global Communications Conference (GlobeCom), IEEE Wireless Communications and Networking Conference (WCNC), IEEE Personal, Indoor and Mobile Radio Communications (PIMRC), IFIP International Conference on New Technologies, Mobility and Security (NTMS) and IEEE International Conference on Communications in China (ICCC).
- IEEE/SAE/ACM/IFAC Connected Vehicles advisory board member.

## Cyprus Scientific and Technical Chamber

May 2012 - Present

*Member*

*Cyprus*

- Member of the Cyprus Scientific and Technical Chamber (ETEK) in Electronic Engineering (including Computer Engineering).

## PAST EXPERIENCE

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### DCA Accredited CRL-1 RPAS Pilot

Aug 2016

- Trained Pilot for Remotely Piloted Aircraft Systems (RPAS) for Complexity and Redundancy Level (CRL) 1; accredited by the Cyprus' Department of Civil Aviation in Aug. 2016.

### King's College London

*Operations Management*

Sept 2008 - Sept 2011

*London, U.K.*

- Principal organizer of the Centre for Telecommunications Research and the IEEE technical and professional seminars.

### MobileVCE

*Technical Activities*

Sept 2008 - Dec 2011

*U.K.*

- Technical Steering Group (TSG) advisor for MVCE Core 5 Green Radio programme. TSG members include NEC, Huawei, Vodafone, Toshiba, Nokia, Thales, Nokia Siemens Networks, Alcatel-Lucent, Fujitsu, Orange and Turner.

### London Wireless Forum

*Technical Advisor*

Jan 2011

*London, U.K.*

- Demonstrator of next-generation mobile network operations at 'Digital Futures' executive event - a joint Mobile VCE/Cambridge Wireless forum for executives and senior managers within the communications industry in the UK, <http://www.mobilevce.com/frames.htm?meetingAgenda.php?MtgRefNo=516>.

### AWTG

*Special scientist*

Jan 2011

*London, U.K.*

- Special scientist of AWTG Limited (<http://www.awtg.co.uk/>); demonstrating Quality of Experience (QoE) for outdoor multihop WiFi Internet access.
- A proprietary QoE Analyser has been used to monitor application layer performance and what the users are actually experiencing on their end of the web browser (using several key performance indicators).
- Tests were conducted as a demonstration for Vodafone UK.

### IEEE Student Branch Congress

*IEEE Student Representative*

Aug 2010

*Leuven, Belgium*

- UK representative for the 2010 edition of the IEEE Student Branch and Graduates Of the Last Decade - GOLD - Congress (the biggest IEEE Region 8 student and graduate event).
- Invited attendee at the IEEE Professional Activities Summit 2010. Undergone training on International Management and Problem Solving skills.

### Trilogy Future Internet Summer School

*Representative*

Aug 2009

*Louvain-la-Neuve, Belgium*

- Representative of the Centre for Telecommunications Research at the Trilogy Future Internet Summer School, 2009. Trilogy is a collaborative research project within the ICT theme of the 7th Framework Programme of the European Commission that contributes to the objective "Network of the Future" of the Work Programme 2007-08.

## RESEARCH AND INNOVATION PROJECTS

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### H2020 SESAME

*Budget: 7M Euros*

Jan 2021 – Dec 2024

*Role: Proposal preparation/ KIOS Technical Project Manager*

- SESAME (Secure and Safe Multi-Robot Systems), Multi-Robot Systems (MRS) comprise distributed and interconnected robotic teams that can carry out tasks beyond the competency of a single robot. Although MRS offer improved scalability and performance, increased robustness, and mission enablement, the lack of a systematic engineering methodology, covering the complete lifecycle of MRS, results in solutions that fail because of fragile design and unrealistic assumptions. SESAME addresses these problems through an open, modular, model-based approach for the systematic engineering of dependable MRS.

## **DG ECHO ARTION**

Jan 2021 – Jun 2022

*Budget: 4K Euros*

*Role: Proposal preparation/ KIOS Technical Project Manager*

- ARTION (Disaster Management Artificial Intelligence Knowledge Network), envisions to become a world-class network for knowledge sharing in the area of artificial intelligence for disaster management that will guide the development and use of AI tools by first responders across Europe. By achieving its strategic objectives ARTION aims to bridge the gap between AI scientists and disaster management experts, build capacity and competency of first responders in the use of AI technology, share knowledge and data, and stimulate further AI research towards application-specific challenges faced throughout the disaster management cycle.

## **H2020 PathoCERT**

July 2020 - June 2023

*Budget: 7M Euros*

*Role: Proposal preparation/ Workpackage Leader*

- PathoCERT (Pathogen Contamination Emergency Response Technologies), aims at strengthen First Responder (FR) capabilities to waterborne pathogen contamination events. To achieve this objective, the project will develop a collection of novel technologies, tools and guidelines including safe and rapid water sampling using drones and intelligent decision support algorithms.

## **DG-ECHO AIDERS**

Jan 2020 - Dec 2021

*Budget: 1M Euros*

*Role: Proposal preparation/ KIOS Technical Project Manager*

- AIDERS (Real-time Artificial Intelligence for DEcision support via RPAS data analyticS), aims at developing application-specific algorithms and novel mapping platform that will harness the large volume of data that first responders are now able to collect through heterogeneous sensors (including visual, thermal and multispectral cameras, LIDAR, CBRN sensors, etc.) on-board RPAS units, and converting that data into actionable decisions for improved emergency response.

## **Cyprus Seeds AIRMOS**

June 2019 - June 2020

*Budget: 73K Euros*

*Role: Principal Investigator / Proposal preparation*

- Artificially Intelligent Real-Time Drone Monitoring Tactics to Safeguard Sensitive Facilities (AIRMOS), implements a novel Artificially Intelligent software toolkit that automates the deployment and use of Unmanned Aerial Vehicles (UAVs) by security service providers to safeguard sensitive facilities. The system acts complementary to existing approaches employed in the Security Services sector and address the growing scale and sophistication of threats by 1) enhancing monitoring and response capabilities, 2) enabling economies of scale while introducing higher security levels.

## **DG-HOME CERETAB**

Aug 2018 - July 2020

*Budget: 1.3M Euros*

*Role: Proposal preparation/ KIOS Technical Project Manager*

- CERETAB (CoopERation for incrEased siTuational Awareness estaBlishment), aims to support the improvement of border surveillance by enhancing cooperation between 2 EU Member States, Greece and Cyprus, which over the recent years suffer from heavy irregular migration attempts via the Mediterranean sea, as well as cross-border crime. The overall objective is to increase the situational awareness within the broad area defined by the Greek-Cypriot sea borders through novel ICT tools for monitoring sea routes for suspected vessels.

**DG-ECHO LEAPFROG**

Jun 2018 - May 2020

*Budget: 418K Euros**Role: Proposal preparation/ Technical Project Manager*

- LEAPFROG(Leading Activities for enrolment of RPAS units in the voluntary pool), aims at introducing RPAS units as modules to the voluntary pool of response capacities at a European level. In turn, Member States can request and make use of RPAS modules to improve their operational capabilities in terms of a plethora of functionalities including aerial mapping for situational assessment, and tracking of emergency events. Through the project, standard operating procedures will first be developed, and new training and exercise activities will be carried out to build skills and competencies of first responder end-users.

**DG-ECHO SWIFTERS**

Jan 2018 - Dec 2020

*Budget: 511K Euros**Role: Proposal preparation/ Technical Project Manager*

- Unmanned Aerial Vehicles (UAVs) are increasingly used by Civil Protection authorities across Europe to address operational needs related to mapping and reconnaissance, monitoring and tracking, to complement utility infrastructures and for delivering help-aid kits. The SWIFTERS proposal capitalizes on UAV swarms to study, design, develop, and test, UAV cooperation strategies to better coordinate the aforementioned complementary activities in order to assist first responders improve their response efficiency and reduce evacuation times. SWIFTERS will enhance the existing capabilities by developing algorithms and software to assist operators effectively deploy UAV swarms in emergency evacuation, train personnel in using swarms of UAVs (each with a specific role in the mission), and transfer new knowledge to the training conducted within the Assessment Mission Course of the Union Civil Protection Mechanism Training Programme.

**DG-MARE CY-CISE**

Jan 2017 - Nov 2019

*Budget: 399K Euros**Role: Member of advisory board*

- This project is dedicated to the implementation of the Common Information Sharing Environment (CISE) that connects national IT systems to national CISE nodes. The project will develop the Cypriot information sharing environment towards an integrated national maritime surveillance awareness and enhancement of cross-sector and cross-border exchange of information.

**H2020 KIOS CoE Teaming Phase 2**

Feb 2017 - Feb 2024

*Budget: 40M Euros      Role: Proposal preparation/ Executive Committee Member/ Senior Researcher*

- The aim of the upgraded KIOS research center to the KIOS CoE (Center of Excellence) is to be an inspiring environment for conducting basic and applied research and innovation in the area of intelligent monitoring, management and security of critical infrastructure systems (CIS). The upgraded Center will be based on 5 strategic pillars: Education and Training, CIS Testbeds, Innovation Hub, Open Knowledge, and Organizational Transformation, all of which will contribute to delivering technological advances and knowledge transfer with high impact to Cyprus and the region. In the implementation of the project, my focus is mainly on the activities of the Education and Training pillar, the CIS Testbeds and the Innovation Hub.

**DG-ECHO PREDICATE**

Jan 2016 - Dec 2018

*Budget: 412K Euros**Role: Proposal preparation/ Technical Project Manager*

- PREDICATE: PREventing Disasters by CAPITALizing on unmanned aerial systems TEchnology. The ultimate goal of the PREDICATE project is to develop the necessary methodologies that will guide the selection and use of UAS in watch-keeping and patrolling of regions of interest.

**H2020 KIOS Teaming Phase 1**

June 2015 - Sept 2016

*Budget: 500K Euros**Role: Proposal preparation/ Business Plan preparation*

- The aim of the proposed TEAMING project is to develop a business plan for the KIOS Research Center of Excellence for Intelligent Systems and Networks, an inspiring environment for conducting basic and



applied research and innovation in the area of intelligent monitoring, management and security of critical infrastructure systems.

### **FP7 COncORDE**

*Budget: 4M Euros*

May 2014 - Sept 2017

*Role: Technical Project Manager*

- The EU research project COncORDE aims to develop a Decision Support System (DSS) with appropriate technological innovations, capable of strengthening the preparedness and interoperability of medical services during an emergency situation. The system will address a broad range of disaster preparedness and response challenges before, during, and after its occurrence. The tool also will lead to improvements in emergency management and crisis management systems and will assist decision-makers in using multiple predictive and factual data and information in order to extract reliable intelligence to guide their actions.

### **ERC Fault-Adaptive**

*Budget: 2M Euros*

Apr 2012 - Mar 2017

*Role: Researcher*

- The emergence of networked embedded systems and sensor/actuator networks has facilitated the development of advanced monitoring and control applications, where a large amount of sensor data is collected and processed in real-time in order to activate the appropriate actuators and achieve the desired control objectives. The aim is to develop a systematic framework to enhance the reliability, fault-tolerance and sustainability of complex distributed dynamical systems through the use of fault-adaptive monitoring and control methods. Emphasis will be given to applications related to critical infrastructure systems (e.g., power, water, telecommunications and transportation systems).

### **KIOS Research Centre for Intelligent Systems and Networks**

*Budget: 1M Euros*

Dec 2010 - Nov 2014

*Role: Researcher*

- The vision behind the proposed KIOS Research Center for Intelligent Systems and Networks is that of creating an inspiring environment for conducting high quality interdisciplinary research for the promotion of a knowledge-based economy in Cyprus, which will ultimately benefit the Cypriot educational system, the high-tech industry and the society at large. The KIOS Research Center aims at contributing to the advancement of knowledge in the area of intelligent networked embedded systems and its applications to the design and management of large-scale complex systems with emphasis on safety-critical and trustworthy systems.

### **CELTIC-Plus Green-T**

*Budget: 3M Euros*

July 2011 - June 2014

*Role: Researcher*

- Green Terminals for Next Generation Wireless Systems. Green-T aims at limiting energy consumption in multi-standard mobile terminals for wireless communication, to prolong the operational times and to avoid active cooling, using cognitive radio and cooperative strategies, while also focusing on preserving a proper level of quality of service and security for the applications.

### **E-park**

*Budget: 400K Euros*

July 2011 - June 2013

*Role: Researcher*

- Utilization of advanced technologies in the payment, use, and management of public Parking Sites. This project aims in the design and implementation of a pioneering system that automates and simplifies the procedures relating to the use and management of various categories of parking areas. In order to accomplish its goals, the proposed system will integrate innovative solutions from different areas of information technology such as communication technologies, wireless networks, and sensor networks.

### **MVCE Core 5 Green Radio**

*Budget: 3M Euros*

July 2008 - Sept 2011

*Role: Researcher*

- The goal of this research is to secure 100x reduction in energy requirements for delivery of high data rate services, thereby reducing CO<sub>2</sub> emissions and Opex costs whilst enabling new services. It is investigating both architectural and individual technological approaches.

## KEYNOTE SPEECHES

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### **Hermes Airports Emergency Campaign**

*Speaker(s): Panayiotis Kolios*

Oct 2018

*Larnaca, Cyprus*

- Drones as a prevention, preparedness and response tool for emergencies

### **European Emergency Number Association Conference**

*Speaker(s): Panayiotis Kolios*

April 2017

*Budapest, Hungary*

- UAS emergency response automations: From theory to practise.

### **International Conference and Exhibition Different City - Smart City**

*Speaker(s): Panayiotis Kolios*

3-5 November 2016

*Bucharest, Romania*

- Emergency response in smart cities based on autonomous aircraft systems.

### **University of Cyprus Summer School 2016**

*Speaker(s): Panayiotis Kolios, Christos Kyrkou, Charalambos Menelaou*  
*University of Cyprus*

11-16 July 2016

*School of Engineering,*

- An introduction to programming of real-time systems and their application to unmanned aircraft systems.

### **Communications, Networking and Photonics Summer School 2012**

*Speaker(s): Panayiotis Kolios*

18-22 June 2012

*School of Engineering, University of Edinburgh*

- Relays in Wireless Networks (<http://www.commnet.ac.uk/node/47>)

### **IEEE GlobeCom MMCOM Workshop 2011**

*Speaker(s): Panayiotis Kolios*

9 December 2011

*Houston, Texas*

- Energy Aware Mobile Communications: Green Radio Techniques and Architectural Considerations, Workshop on Multimedia Communications (MMCOM) - Enabling Green Wireless Multimedia Communications (<http://www.fuseco-workshop.org/mmcom2011/>)

## PUBLICATIONS

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### Magazine Articles

- C. Kyrkou, S. Timotheou, **P. Kolios**, T. Theocharides, and C. Panayiotou, Drones: Augmenting our quality of life, *IEEE Potentials*, Jan/Feb. 2019.
- **P. Kolios**, V. Friderikos and K. Papadaki, Energy aware mobile video transmission utilizing mobility, *IEEE Network, Special Issue on Video over Mobile Networks*, Mar. 2013.
- **P. Kolios**, V. Friderikos and K. Papadaki, Energy Consumption and Resource Utilization in Mechanical Relaying, *IEEE Vehicular Technology Magazine*, Mar. 2011, Page(s):24 - 30.

### Book Chapters

- G. Eftychidis, I. Gkotsis, **P. Kolios**, and C. Peleties, UAVs and Their Use in Servicing the Community, *Community-Oriented Policing and Technological Innovations*, Springer Briefs in Criminology, Apr. 2018.
- K. Manousakis, **P. Kolios** and G. Ellinas, Multi-period Attack-aware Optical Network Planning under Demand Uncertainty, *InTech "Optical Fiber and Wireless Communications"*, June 2017.
- P. Petrides, **P. Kolios**, C. Kyrkou, T. Theocharides and C. Panayiotou, Disaster prevention and emergency response using Unmanned Aerial Systems, *Springer "Smart Cities in the Mediterranean Coping with Sustainability Objectives in Small and Medium-sized Cities and Island Communities"*, October 2017.
- **P. Kolios**, C. Panayiotou, and G. Ellinas, Disaster Resilient Telematics based on Device-to-Device Communication, *Wiley-ISTE - Public Safety Networks Series*, Vol:3, Feb. 2017.
- **P. Kolios**, A. Pitsillides, O. Mokryn and K. Papadaki, Data Dissemination in Public Safety Networks, *Wiley-ISTE - Public Safety Networks Series*, Vol:2, May 2016.
- **P. Kolios**, V. Friderikos and K. Papadaki, Mechanical Relaying Techniques: Design and Experimental Results, *Book chapter for Green Radio Communication Networks*, Cambridge University Press.

### Journal Papers

- S. Papaioannou, **P. Kolios**, T. Theocharides, C. Panayiotou, and M. Polycarpou, A Cooperative Multi-Agent Probabilistic Framework for Search and Track Missions, *IEEE Transactions on Control of Network Systems*, Oct 2020.
- **P. Kolios**, K. Koumidis, C. Panayiotou, and G. Ellinas, Beaconing-based networking for localized information exchange in emergency management, *Ad Hoc Networks*, Oct 2020.
- **P. Kolios**, G. Ellinas, and C. Panayiotou, Cyber-physical Interplay for Data Offloading in Vehicular Networks, *IEEE Networking Letters*, Apr 2020.
- S. Papaioannou, **P. Kolios**, T. Theocharides, C. Panayiotou, and M. Polycarpou, JoSAT: Jointly-optimized Searching and Tracking with Random Finite Sets, *IEEE Transactions on Mobile Computing*, Jun. 2019.
- C. Menelaou, S. Timotheou, **P. Kolios**, and C. Panayiotou, Minimizing traffic congestion through continuous-time route reservations with travel time predictions, *IEEE Transactions on Intelligent Vehicles*, July 2018.
- C. Menelaou, **P. Kolios**, S. Timotheou, and C. Panayiotou, Controlling road congestion via a low-complexity route reservation approach, *Transportation Research Part C*, May 2017.
- C. Menelaou, S. Timotheou, **P. Kolios**, and C. Panayiotou, Improved Road Usage through Congestion-free Route Reservations, *Transportation Research Record*, Nov 2016.
- C. Heracleous, **P. Kolios**, C. Panayiotou, M. Polycarpou, and G. Ellinas, Hybrid systems modeling for critical infrastructure interdependencies analysis, *International Journal on Reliability Engineering and System Safety*, Aug 2016.

- G. Milis, **P. Kolios**, G. Van Melick, T. Staykova, I. Helsloot, G. Ellinas, C. Panayiotou, and M. Polycarpou, Integrated modelling of medical emergency response process for improved coordination and decision support, *IET Healthcare Technology Letters*, July 2016.
- K. Koumidis, **P. Kolios**, C. Panayiotou, and G. Ellinas, Proximity-based Alert Forwarding Under Varying Mobility Levels in Adhoc Networks, *International Journal of Distributed Systems and Technologies*, May 2016.
- **P. Kolios**, C. Panayiotou, G. Ellinas, and M. Polycarpou, Data-Driven Event Triggering for IoT Applications: A Review of its Three Phases, *IEEE Internet of Things Journal*, May 2016.
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### Conference Papers

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- E. Rigas, **P. Kolios**, and G. Ellinas, Extending the multiple travelling salesman problem to schedule drones for monitoring missions, *IEEE Intelligent Transportation Systems Conference*, Sept. 2020. **Best Paper Award**
- C. Menelaou, S. Timotheou, **P. Kolios**, and C. Panayiotou, Flexible Route-Reservations through pricing, *IEEE Intelligent Transportation Systems Conference*, Sept. 2020.
- N. Souli, R. Makrigiorgis, A. Anastasiou, P. Petrides, A. Zacharia, A. Lazanas, P. Valianti, **P. Kolios**, and G. Ellinas, HorizonBlock: Implementation of an Autonomous Counter-Drone System, *International Conference on Unmanned Aircraft Systems*, Jun. 2020.
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- R. Makrigiorgis, **P. Kolios**, S. Timotheou, T. Theocharides, and C.G. Panayiotou, Extracting the fundamental diagram from aerial footage, *IEEE Vehicular Technology Conference*, May 2020.
- N. Souli, **P. Kolios**, and G. Ellinas, Relative Positioning of Autonomous Systems using Signals of Opportunity, *IEEE Vehicular Technology Conference*, May 2020.
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- S. Papaioannou, **P. Kolios**, T. Theocharides, C. Panayiotou, and M. Polycarpou, Decentralized Search and Track with Multiple Autonomous Agents, *IEEE Conference on Decision and Control*, Dec. 2019.
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- C. Menelaou, S. Timotheou, **P. Kolios**, C. Panayiotou and M. Polycarpou, Scheduling Vehicles for On-Time Arrival using Route-Reservations, *IEEE Intelligent Transportation Systems Conference*, Oct. 2019.
- M. Michalopoulou, **P. Kolios**, C. Panayiotou and G. Ellinas, An Event-triggering Approach for Bus Tracking based on Multimodel Mobility Prediction, *IEEE Intelligent Transportation Systems Conference*, Oct. 2019.
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- L. Tziovani, **P. Kolios**, L. Hadjidemetriou, E. Kyriakides, Power-flow scheduling in non-residential buildings integrating battery storage and renewable solutions, *IEEE International Energy Conference*, Jun. 2018.
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- C. Menelaou, S. Timotheou, **P. Kolios**, C. Panayiotou, and M. Polycarpou, Optimal Path Selection in a Continuous-Time Route Reservation Architecture, *IEEE International Conference on Intelligent Transportation Systems*, Oct. 2017.

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- P. Petrides, C. Kyrkou, **P. Kolios**, T. Theocharides, C. Panayiotou, Real-time Vehicle Detection using Unmanned Aircraft Systems, *9th Cyprus Workshop on signal Processing and Informatics*, June 2016.
- S. Timotheou, C. Menelaou, **P. Kolios**, C. Panayiotou, and M. Polycarpou, Autonomic fault-adaptive traffic state estimation and sensor-fault detection in road traffic systems, *2nd International Competition of the EU COST Action "ARTS: Towards Autonomic Road Transport Support Systems"*, 22nd ITS World Congress, Oct 2015.