

ACTIVITY REPORT 2018



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KIOS Research and
Innovation Center of
Excellence

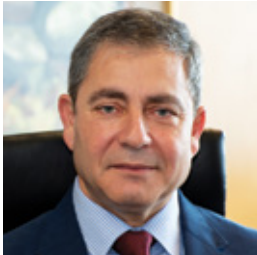
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Forewords



Message from the Rector

“ The KIOS Center
is a flagship
research and
innovation Center
of Excellence

Dear reader,

Research constitutes a key driver for the economic and social development of a country, since it fosters knowledge, new ideas and at the same time it develops new products and services that improve the quality of our lives.

High-caliber scholarly research is one of the main pillars of development of the University of Cyprus since its establishment in 1989. In recent years, the University has become internationally recognized as a leading research institution for its contribution to the advancement of science and culture.

Today, there are 23 departments and 14 research units and centers at the University of Cyprus, covering a broad spectrum within the life, social, natural and engineering sciences. It is worth mentioning that the University of Cyprus has implemented a large number of research projects funded by the European Commission, the Cyprus Research Promotion Foundation, several public and private research organizations, as well as industry and governmental organizations. In 2018, research funding from external sources reached €16,5 million. UCY is currently participating in 250 projects from which 118 are EU-funded under Horizon 2020, Erasmus+, Justice, Life, Cost Action, FP7 and Interreg.

The KIOS Research Center has become, through a highly competitive process a European Center of Excellence, with significant funding from the European Union and complementary funding from the Government of Cyprus and the University of Cyprus. This success is evidence of the high-caliber research activity being undertaken at the University of Cyprus. The KIOS Center is a flagship research and innovation Center of Excellence —the first such Center in Cyprus— capable of stimulating the creation and growth of a regional industrial ecosystem with major economic and societal benefits for Cyprus and Europe.

I would like to congratulate the Faculty and researchers of the Center for their remarkable dedication and outstanding research achievements. I am confident that the KIOS Research and Innovation Center of Excellence will continue its dynamic development in order to achieve greater success!

Sincerely,

A handwritten signature in blue ink, which appears to read 'Tasos Christofides'.

Professor Tasos Christofides,
Rector, University of Cyprus



Message from the Director

“The center provides new opportunities for young researchers to pursue their dreams

The KIOS Research Center for Intelligent Systems and Networks was established in 2008 through the close collaboration of a group of faculty at the University of Cyprus. In 2017 the Center, in collaboration with Imperial College London, became a European Research and Innovation Center of Excellence through a highly competitive EU strategic Horizon 2020 program for “Spreading Excellence and Widening Participation – Teaming.”

The KIOS Research and Innovation Center of Excellence conducts multidisciplinary research and innovation in the area of intelligent systems and networks with emphasis on monitoring, control, management and security of critical infrastructure systems, such as electric power systems, water distribution networks, telecommunication networks and transportation systems.

Currently, the KIOS Center of Excellence employs more than 100 people through external research and innovation projects, making it the largest research center in Cyprus in the area of Information and Communication Technologies (ICT). The Center is proud to provide new opportunities for young researchers to pursue their dreams on topics of global importance, such as machine learning, automation and robotics, Internet of Things, cybersecurity, etc.

Our vision is to provide an inspiring environment for conducting excellent, cutting-edge research, and to produce new knowledge and tools for solving real-life problems in the application domains of interest to the Center. Towards this direction, we created the KIOS Innovation Hub, which promotes fruitful collaboration between the KIOS Center of Excellence and industry, operators of critical infrastructure systems, regulators and governmental organizations, with the aim to create an ecosystem that spans the entire innovation cycle – from conception of an idea to commercialization. A number of organizations have already joined the KIOS Innovation Hub and are enjoying the benefits of this cooperation.

I would like to express my gratitude to the University of Cyprus, which has supported the KIOS Research Center during all these years and has empowered its growth. I would also like to thank all the KIOS personnel for their hard work, commitment and spirit of collaboration, which has helped in making KIOS a Center of Excellence!

We hope that you will find this report informative. For further information about the Center, please visit the KIOS website, www.kios.ucy.ac.cy, or come and visit us in person.

Prof. Marios Polycarpou
Director, KIOS Research and Innovation Center of Excellence
Professor, Department of Electrical and Computer Engineering

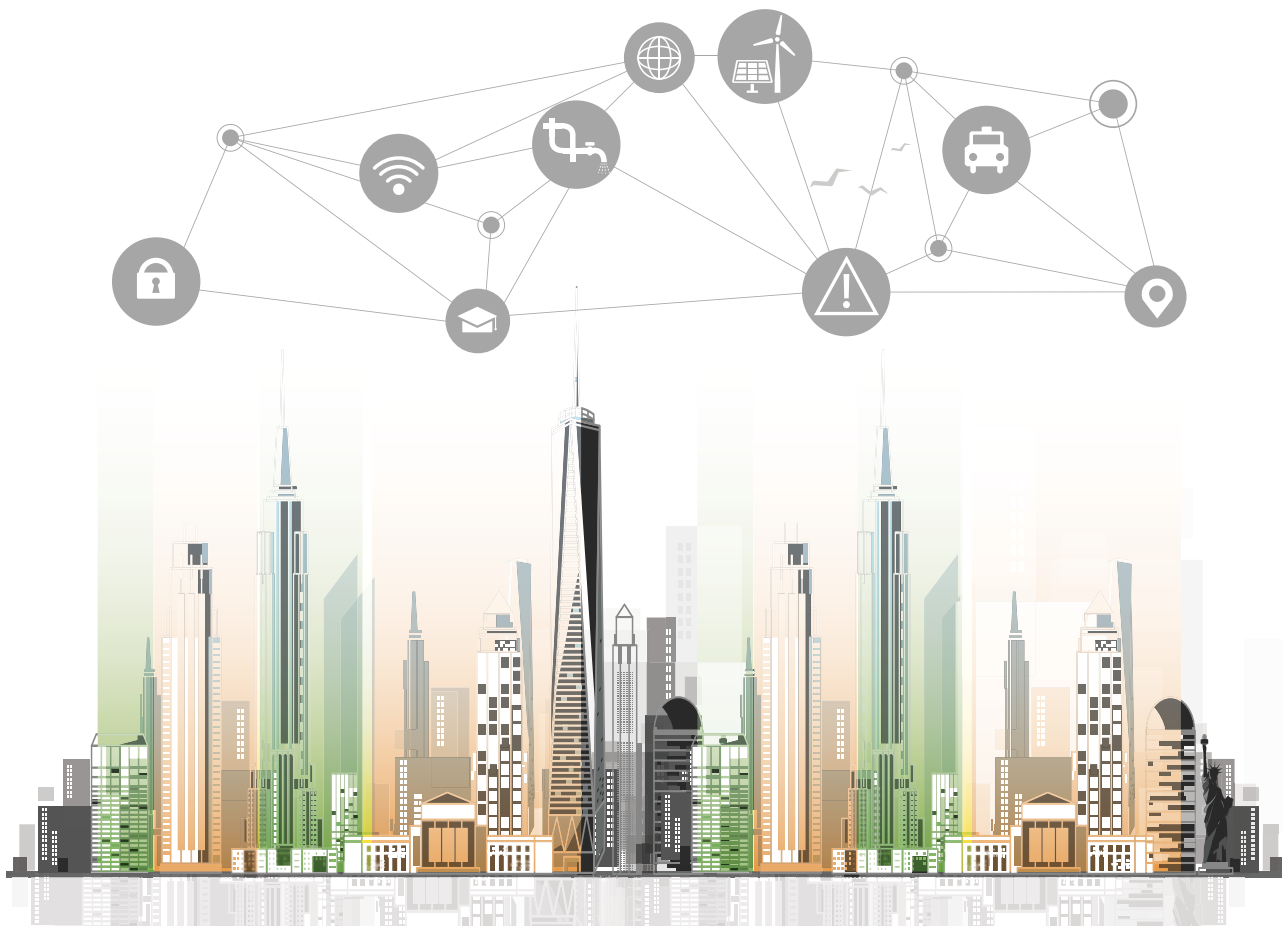
In brief



The KIOS Research Center was established in 2008 at the University of Cyprus and was subsequently selected by the EU to advance into a Research and Innovation Center of Excellence in 2017.

The mission of the KIOS Research and Innovation Center of Excellence (KIOS CoE) is to conduct multidisciplinary research and innovation in the area of Information and Communication Technologies (ICT) with emphasis on the monitoring, control, management and security of critical infrastructures. These infrastructures include large-scale, complex systems such as power and energy systems, water systems, transportation systems, telecommunication networks, and emergency management and response systems.

The Center's vision is to provide an inspiring environment for conducting excellent, cutting-edge research at a global scale, producing new knowledge and advanced engineering and management tools that can be applied to solve timely and real-life problems in the considered Critical Infrastructure Systems.



Research in high-tech areas
important to Cyprus and the global economy

SCIENTIFIC FOUNDATIONS

- Computational Intelligence & Machine Learning
- Control & Optimization
- Modelling & Simulation
- Intelligent Data Processing
- SW/HW System Design & Integration

APPLICATION AREAS

- Power & Energy Systems
- Water Systems & Environmental Monitoring
 - Intelligent Transportation Systems
- Telecommunication Systems & Networks
 - Emergency Management & Response

RESEARCH OUTCOMES

- Intelligent Monitoring & Control
- Resilience, Adaptation & Reconfiguration
- Security, Safety & Trustworthiness
- Big Data Analysis & Management
- Performance & Energy Optimization

KIOS Research Center: A 10-year journey

“ The overall vision of the Center is to create an inspiring environment for conducting high-quality interdisciplinary research in order to promote a knowledge-based economy in Cyprus, which will ultimately benefit the Cypriot educational system, industry, and society at large.

The KIOS Research Center for Intelligent Systems and Networks, was officially established in 2008 at the University of Cyprus.

In 2017, the Center was upgraded to a European Center of Excellence, through a competitive “Teaming” grant of the European Union, and was renamed KIOS Research and Innovation Center of Excellence (KIOS CoE).

The Center’s research priorities consist of the development of advanced engineering and management tools that can improve the operation, efficiency, reliability, safety and security of critical infrastructure systems such as electric power systems, transportation networks, water distribution systems, telecommunication networks, and emergency management and response systems.

The overall vision of the Center is to create an inspiring environment for conducting high-quality interdisciplinary research in order to promote a knowledge-based economy in Cyprus, which will ultimately benefit the Cypriot educational system, industry, and society at large.

The road to research excellence

Since its inception, the Center has reached some important milestones, which have helped the Center to develop from infancy into a Research Center with established scientific reputation in Information and Communication Technologies (ICT). Towards the road to excellence, the KIOS Center had some significant successes, including an ERC Advanced Grant (the first such grant awarded to the University of Cyprus), an ESF COST Action (the first to be coordinated by a team from Cyprus), and a capacity building Strategic Grant from the Cyprus Research Promotion Foundation.

The advancement to a European Research Center of Excellence

A crucial milestone in the Center’s history was the “Teaming” grant from the European Commission in 2017, which enabled the advancement of KIOS into a



world-class Center of Excellence. As part of the “Teaming” Grant, the Center will receive significant funding from the European Commission, the Government of Cyprus and the University of Cyprus, totaling more than 40 million euros over the next 15 years. This was the first time that such a large grant was secured for research and innovation in Cyprus.

The aim of the “Teaming” funding program is to bridge the gap between countries in terms of research and innovation capabilities, by establishing world-class Centers of Excellence which can facilitate access to new scientific networks and unlock new opportunities for economic development. In this endeavor, KIOS has as an invaluable partner, Imperial College London which will share best-practices and expertise to help with the development of the KIOS Research and Innovation Center of Excellence.

What lies ahead

During the official launch of the KIOS CoE, the President of the Republic of Cyprus H.E. Mr. Nicos Anastasiades, stated that KIOS CoE is a new flagship initiative that will have a positive impact on the economy of Cyprus. “This is not just an excellent opportunity, it is also very timely”, he added.

KIOS is successfully creating a research and innovation ecosystem in Cyprus, capable of connecting universities, technology companies and end-users, governmental organizations, as well as companies which promote entrepreneurship. This cooperation network is generating new research results and technology products, is creating new high-tech employment opportunities, is increasing Cyprus’ ICT capacity, is elevating internationally the research and scientific profile of Cyprus, and is contributing to the societal and economic growth of Cyprus.

In the next few years, KIOS will work to maximize the opportunities made available through the Teaming grant. The ultimate goal is to become a leading European research center of excellence in monitoring, control, security and management of critical infrastructure systems, and a regional hub for innovation and entrepreneurship, making a significant contribution towards the promotion of research and innovation, with major economic and societal benefits for Cyprus and Europe.

KIOS is successfully creating a research and innovation ecosystem in Cyprus, capable of connecting universities, technology companies and end-users, governmental organizations, as well as companies which promote entrepreneurship. ”



Research Activities



Scientific dissemination

Scientific dissemination is an important and integral part of the KIOS Center of Excellence (KIOS CoE) since it fosters the transfer of knowledge and results in international scientific communities. In 2018, the KIOS Faculty and the wider KIOS research team (including KIOS members at Imperial College London) have published 72 journal and conference papers.

- **Peer-reviewed journal publications**

Academic journals serve as one of the principal forums for researchers, to disseminate their research work into the scientific community. The KIOS CoE researchers continue to target high-quality journals addressing the research undertaken at the KIOS CoE.

The KIOS research team has published in 29 peer-reviewed journals at the most prestigious journals within their areas of expertise.

- **Conference proceedings**

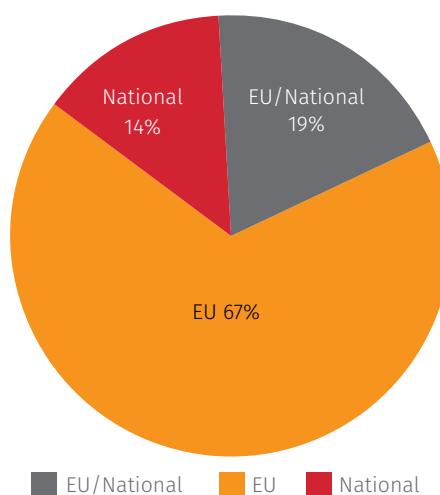
Conference proceedings consist of a fast way for scientific dissemination, allowing researchers to present their research to conferences, workshops and symposia, aiming at the fast and wide adoption of their research ideas by their peers in the scientific community. Within 2018, the KIOS Research team has published 43 papers in Conference Proceedings.

Funded research programs

During 2018, KIOS CoE has coordinated and/or participated in 21 research projects funded by international and national sources. The majority of research funding originates from EU sources, representing 67% of the research project funding at KIOS.



FUNDED RESEARCH PROGRAMS



KIOS CoE personnel

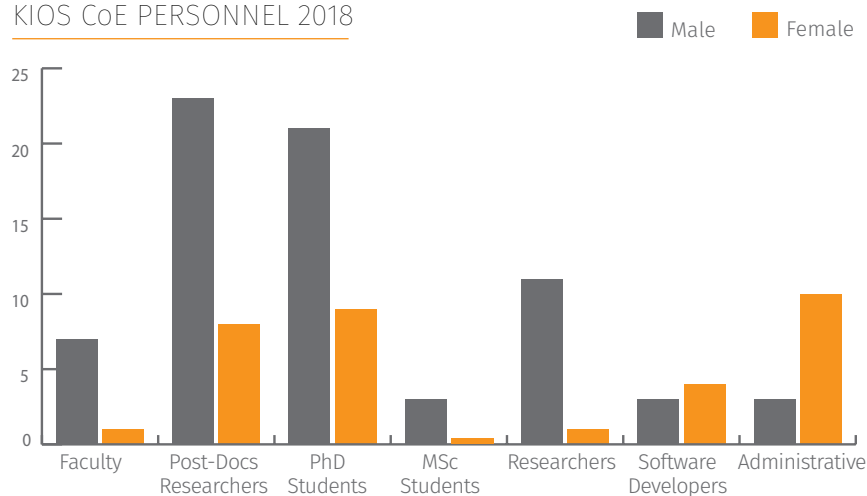
The human capital is an important factor for the success of an organization. Thus the KIOS CoE places particular emphasis in recruiting high-caliber researchers who will contribute significantly to the development of the Center.

The KIOS CoE places particular emphasis in promoting diversity, equal opportunities and gender balance at all levels in its research and innovation teams. Towards this end, the Center endeavors to increase gender balance among its research personnel by offering female researchers an attractive working environment. In addition, the KIOS CoE develops recruitment initiatives to attract highly qualified personnel from Europe and the Middle East - North Africa (MENA) region.

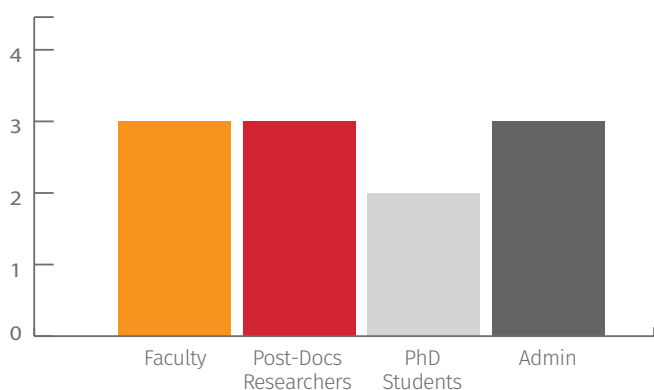
At the end of 2018, the KIOS CoE employed 104 researchers while it envisions to increase the number of researchers to 150-200 by the year 2022. At the KIOS CoE spoke at Imperial College there are 11 researchers.

104
RESEARCHERS
EMPLOYED
by KIOS
at the end
of 2018

KIOS CoE PERSONNEL 2018



KIOS CoE SPOKE (IMPERIAL)



Research Projects

21 FUNDED RESEARCH PROJECTS in 2018

During 2018 the KIOS Research and Innovation Center of Excellence was involved in 21 multi-disciplinary research projects funded by international and national sources. These projects have focused on the monitoring, control, management and security and of critical infrastructure systems such as power and energy systems, water networks, transportation networks, telecommunication networks and emergency management and response systems.

List of projects in 2018:

	ACRONYM	FULL TITLE	FUNDING SOURCE	KIOS ROLE
1	CUREX	seCUre and pRivate hEalth data eXchange	Horizon2020 (EU)	Partner
2	CERETAB	CoopERation for incrEased siTuational Awareness estaBlishment	DG HOME ¹ (EU)	Partner
3	ITS-CONNECT	Intelligent Transportation Systems in the era of Connected Vehicles	RESTART (RPF ²)	Coordinator
4	CAPACIDI	Complementary Action for Projects to ACHieve Improvements in Delivery and Impact	RESTART (RPF)	Coordinator
5	LEAPFROG	Introducing RPAS modules to the voluntary pool of response capacities and leading Activities for enrolment of RPAS units in the voluntary pool	DG ECHO ³ (EU)	Partner
6	WaterAnalytics	Smart Analytics for Improving Efficiency of Water Distribution Networks	RESTART (RPF)	Partner
7	SWIFTERS	Safe and Rapid Evacuation Facilitated by UAV Swarms	DG ECHO (EU)	Coordinator
8	SmartWater2020	Intelligent Water Distribution Networks for Reducing Loss	INTERREG ⁴ Greece-Cyprus	Coordinator
9	FLEXITRANSTORE	An Integrated Platform for Increased FLEXibility in smart TRANSmision grids with STORAge Entities and large penetration of Renewable Energy Sources	Horizon2020 (EU)	Partner
10	ENHANCE	Enhanced rooftop PV integration through Kinetic storage and wide area monitoring	SOLAR ERA NET (EU/RPF)	Coordinator

	ACRONYM	FULL TITLE	FUNDING SOURCE	KIOS ROLE
11	KIOS CoE	The KIOS Research and Innovation Centre of Excellence	Horizon2020 (EU)	Coordinator
12	ATOM	Advancing the state of the art of MIMO: the key to the successful evolution of wireless networks through international staff exchanges	Horizon2020 (EU)	Partner
13	3DMicroGrid	Innovative technologies for smart energy management and control of a micro-grid	ERANETMED ⁵ (EU/RPF)	Partner
14	COM-MED	Communication systems with renewable energy micro-grid	ERANETMED (EU/RPF)	Coordinator
15	REDESIGN	Redesigning educational curricula and digitally-afforded collaborations to promote multimodal learning experiences	ERASMUS+ (EU)	Coordinator
16	CY-CISE	Cypriot information sharing environment towards an integrated national maritime surveillance awareness and enhancement of cross-sector and cross-border exchange of information	EASME ⁶ (EU)	Partner
17	DOMOGNOSTICS	Intelligent Building Automation Diagnostics	Horizon2020 (EU)	Coordinator
18	ERASMUS - Physics	Improvement of master-level education in the field of physical sciences in Belarusian universities	ERASMUS+ (EU)	Partner
19	PV2GRID	A Next Generation Grid Side Converter with Advanced Control and Power Quality Capabilities	SOLAR ERA NET (EU/RPF)	Coordinator
20	SHIELD	Security Enhancement of Optical Network Logical Design	Horizon2020 (EU)	Coordinator
21	FAULT-ADAPTIVE	Fault-Adaptive Monitoring and Control of Complex Distributed Dynamical Systems	Horizon2020 (EU)	Coordinator

(1) EC Directorate-General for Migration and Home Affairs (DG HOME)

(2) Cyprus Research Promotion Foundation (RPF)

(3) EC Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG ECHO)

(4) INTERREG European Territorial Cooperation Programs

(5) EURO-MEDITERRANEAN Cooperation through ERANET joint activities and beyond

(6) European Maritime and Fisheries Fund

Research Projects

Selected projects

A sampling of research at KIOS CoE is presented below.



ENHANCE

Innovative residential photovoltaic systems

THE ENHANCE research project develops an innovative system for seamless and massive deployment of solar energy into the power system by using innovative residential photovoltaic systems. This system will increase the competitiveness of solar power in the energy market by extending the lifetime of photovoltaic systems and reducing the generation cost of the solar kilowatt.

This specific project is funded by the 7th Framework Program of the European Union (SOLAR-ERA.NET) through the Research Promotion Foundation of Cyprus and the Ministry of National Energy and Water Infrastructures of Israel.

FLEXITRANSTORE



Smart innovations for more flexible energy systems

The FLEXITRANSTORE project aims to develop a next generation Flexible Energy Grid, for smarter and more robust power systems. More specifically, it will demonstrate new approaches to integrate renewable energy sources and storage technologies through large scale pilot installations, leading to increased flexibility of the transmission level of power systems and a significantly higher capability to accommodate renewable energy.

This large innovation project is funded by the EU under the Horizon 2020 program and includes 28 partner organizations from 14 countries of the European Union.

SWIFTERS



Safe and rapid evacuation facilitated by UAV swarms

The KIOS Research and Innovation Center of Excellence (CoE) is coordinating an EU funded project, entitled SWIFTERS. This project aims to assist civil and maritime operations to effectively use Unmanned Aerial Vehicles (UAV) swarms for the prevention and response to emergency situations. The project is funded by the European Union Civil Protection (DG ECHO).

The project consortium partners comprises of 3 Civil Protection organizations (the German Aerospace Center, the Cyprus Civil Defence, and the Civil Protection of the Region of Sardinia in Italy) and 2 Research Institutes (the KIOS CoE and the Center for Security Studies in Greece).

WATERANALYTICS



Improving efficiency of water distribution networks

The WaterAnalytics project aims at making smart water technologies accessible to all water operators, by offering them an innovative low-cost intelligent software/hardware solution designed to reduce the water system's operational expenses, leakages, and energy usage. The solution is based on state-of-the-art research-based data-analytics, crowd-sourcing, and machine learning, to improve the ability to detect and isolate events within a water distribution network.

The project's consortium consists of KIOS CoE and PHOEBE Research and Innovation Ltd and is funded by the Cyprus Research Promotion Foundation.

Intelligent water distribution networks for reducing water losses

The project SmartWater2020, “Intelligent Water Distribution Networks for Reducing Water Losses” develops smart technologies capable of helping water authorities to improve their water distribution system’s monitoring and control capabilities which in turn can help reduce water losses.

The project SmartWater2020 is coordinated by the KIOS CoE at the University of Cyprus. The project’s partners are the Water Boards of Limassol and Larnaca, the Water Development Department, the Foundation for Research and Technology (FORTH) and the Municipal Water Supply and Sewerage Company Malevizi (Greece).

This project is funded by the INTERREG V-A “Greece-Cyprus 2014-2020” Cooperation Program.

SMARTWATER2020



Integrated platform for maritime surveillance awareness

CY CISE aims at enhancing the national Cypriot maritime capabilities and covers cross-sectorial exchange of information among seven maritime communities in Cyprus and cross-border exchange of information between the Cypriot entities and maritime authorities in Greece.

The KIOS CoE at the University of Cyprus is responsible to analyze and identify all user needs, define the use cases, as well as define the user requirements for the Cypriot CISE adaptor, the National Situational Picture Manager (NSPM), and the connection with the Greek NSS CISE adaptor (developed within the Hellenic CISE project).

The project was funded from the European Commission and European Maritime and Fisheries Fund.

CY CISE



Intelligent building automation diagnostics

The ERC Proof-of-Concept project entitled Domognostics aims at reducing energy losses in buildings by using intelligent building automation diagnostics. The Domognostics project addresses a market need for an intelligent building automation diagnostic system, capable of facilitating continuous and effective monitoring of the buildings, detecting and isolating any component faults or unexpected events, and reconfiguring the operation of the building’s automation system.

For this specific project KIOS collaborates with PHOEBE Research and Innovation Ltd. PHOEBE is responsible for the integration of research results into a cloud-based real-time monitoring platform, and the implementation of a business study for commercializing the innovative solutions from this project in Europe and internationally.

DOMOGNOSTICS



Improving efficiency of road transport

The objective of the ITS-CONNECT project is the development of novel monitoring and control solutions that exploit new capabilities that arise in the era of connected vehicles, aiming to significantly improve the efficiency of road transport by alleviating congestion at the highest possible degree.

The project is funded by the Cyprus Research Promotion Foundation.

ITS – CONNECT

KIOS Innovation Hub: Collaboration with Industry

11 ACTIVE PROJECTS with the INDUSTRY in 2018

The KIOS Innovation Hub was created in 2017 with the aim to enable the technology transfer of the core research competencies of KIOS CoE in the area of ICT to organizations involved in the monitoring, control, security and management of critical infrastructures.

Its vision is to promote collaboration between academia, industry, operators of critical infrastructure systems, regulators, as well as governmental organizations with the ultimate goal to create an ecosystem that spans the entire innovation cycle from conception of an idea to its commercialization.

Up to date, a number of organizations and companies have joined the KIOS Innovation Hub. These include the Water Development Department and the Water Board of Limassol for water resource management projects, the Electricity Authority of Cyprus (EAC) and the Transmission Systems Operator Cyprus (TSO) for energy-related projects, the Department of Public Works and the Department of Electromechanical Services of the Ministry of Transport, Communications and Works for transportation-related projects, as well as the Emergency Response Unit, the Ports and Marine Police of Cyprus Police, for matters related to emergency response systems.

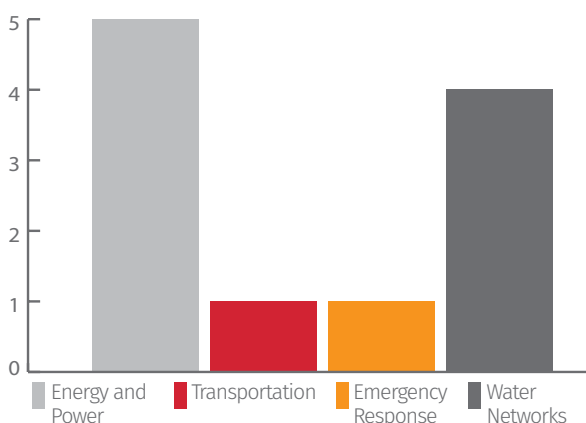


Power and energy systems

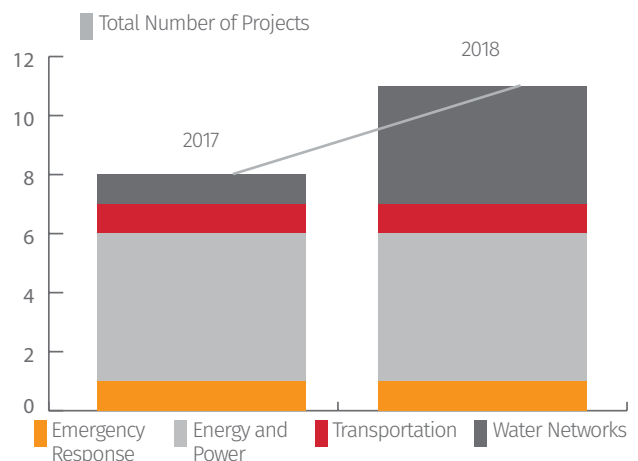
During 2018, the KIOS CoE undertook several research projects in collaboration with the Electricity Authority of Cyprus and the Transmission System Operator, which were related to the optimization of the generation, transmission, and distribution energy systems. Some examples of these research activities include the monitoring of the low-voltage distribution grid in real time, the development of a vision-based aerial monitoring platform (using drones) for the inspection of power distribution lines and the detection of obstacles and insulation faults, the characterization and classification of consumer loads in order to define profile classes based on the annual energy consumption of consumers in Cyprus, and finally the identification and calculation of erroneous transmission line parameters.

This research collaboration will result in optimizing the operation of the system, in the reduction of costs, the minimization of risks and an overall better customer experience.

NUMBER OF ACTIVE PROJECTS IN 2018



KIOS INNOVATION HUB PROJECTS



Transportation systems

Aiming at achieving a more efficient monitoring and management of Cyprus' transportation network for passengers and businesses, the KIOS CoE develops innovative technological methods in collaboration with the Public Works and Electromechanical Services Departments. These methods will result in substantial traffic congestion relief, leading eventually to the decrease of travel time, fuel consumption and CO2 emissions, and the improvement of the quality of life in general.



Emergency management and response systems

Regarding the Emergency Response sector, KIOS CoE has established a strong collaboration with the Cyprus Police and has developed significant expertise in exploiting technologies for emergency management and response systems. Specifically, KIOS CoE develops intelligent functionalities (including automated path-planning, real-time image analysis, object detection, as well as distribution of supplies) that assist first-responder operators to rapidly achieve their missions in a more effective and efficient manner.

It is worth mentioning that in 2018 the KIOS CoE participated in a number of international exercises for crisis management. Further, both in January 2018 and in March 2018 the KIOS CoE conducted training courses regarding the utilization of Drones in Emergency Management at the premises of the Civil Protection Unit in Argentina and at its premises in Cyprus respectively.



Water systems and water resource management

The KIOS CoE is carrying out top level research in the area of water distribution networks in order to address significant challenges in the monitoring, control and management of urban water distribution systems. Towards this end, KIOS researchers develop novel technologies capable of helping water authorities, such as the Cyprus Water Development Department and the Water Board of Limassol to improve their water distribution system's in reducing water losses, increasing efficiency and improving water quality monitoring.



Education & Training Activities

Education and training activities are necessary for building and maintaining scientific excellence at the Center. During 2018, a number of activities have been implemented such as the development of a new MSc program in Intelligent Critical Infrastructure Systems and the organization of the KIOS Graduate Summer School, the Distinguished Lecture Series and the Training/Seminar Series.



New MSc Program in Intelligent Critical Infrastructure Systems

During 2018, several activities have taken place, related to the development of the MSc program in Intelligent Critical Infrastructure Systems. The program will be 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. Courses will be taught by renowned scholars from both institutions.

In 2018, the program has been evaluated by an external evaluation committee as part of the accreditation process by the Cyprus Agency of Quality Assurance and Accreditation in Higher Education (DIPAE), receiving excellent comments from the evaluators. The program will receive its first students in September 2019 and it is expected to make an outstanding addition to the educational landscape in Cyprus and internationally.

KIOS CoE Graduate Summer School

The KIOS CoE in collaboration with Imperial College London organized the Graduate Summer School 2018 on Intelligent Systems and Control, for young professionals, PhD students and recent graduates. Two world-recognized experts in their fields, Professor Sergios Theodoridis (University of Athens) and Professor



01

Alberto Isidori (Sapienza University of Rome), led the Summer School (photo 1).

The event attracted approximately 100 PhD students and researchers from Cyprus and abroad and offered them the opportunity to participate in the scientific research process alongside internationally recognized scientists and mentors. The 5-day program included, among others, lectures, practical exercises, laboratory courses, daily poster sessions, a machine-learning hackathon as well as social activities.

KIOS CoE Distinguished Lecture Series

The aim of the KIOS Distinguished Lecture Series is to host world-class researchers at the University of Cyprus and to deliver specialized lectures in relevant science and technology fields. In 2018, the KIOS CoE hosted 6 internationally recognized scientists who gave talks on cutting-edge research and innovation advances in their respective fields.

Professor Petros A. Ioannou from the University of Southern California gave a talk on "Traffic Flow Control: Closing the loop". Professor Alessandro Astolfi from Imperial College London presented the topic "Moments of Nonlinear Systems: From Model Reduction to Identification and Circuits Theory". Professor Christos G. Cassandras from Boston University gave two lectures on "Decentralized Control and Optimization of Cooperative Multi-Agent Systems" and "Decentralized Control and Optimization in the Internet of Cars".

Professor Mladen Kezunovic from Texas A&M University talked about "Big Data in Smart Grids: Challenges and Opportunities", whereas Professor John Lygeros from ETH Zurich presented the topic "Coordination and control in next generation energy systems". Finally, Dr Eleni Pratsini, Managing Director at Accenture Technology, talked about "The unstoppable growth of AI and Analytics – is industry really ready?". (photos 2,3,4)

6
Distinguished
SCIENTISTS
shared their
KNOWLEDGE
and **EXPERTISE**
with researchers
in 2018



02



03



04

Honors & Awards

“ This is the second consecutive year that a researcher at KIOS CoE wins the Cyprus Young Researcher Award from the Cyprus Research Promotion Foundation, in the Physical Sciences and Engineering category.

KIOS researcher wins the Cyprus Young Researcher Award

Dr. Konstantinos Manousakis, a Research Associate at the KIOS Research and Innovation Center of Excellence (KIOS CoE) of the University of Cyprus, has received the “2018 Young Researcher Award” from the Cyprus Research Promotion Foundation. The award was presented by H.E. the President of the Republic Mr. Nicos Anastasiades.

This is the second consecutive year that a researcher at KIOS CoE wins the Cyprus Young Researcher Award from the Cyprus Research Promotion Foundation, under the Physical Sciences and Engineering category.

Dr. Manousakis recent research work has focused on providing security for next-generation optical networks against physical layer attacks, through a Marie Curie Career Integration Grant (MC-CIG) for the period 2014-2018. This grant supported a project entitled “Security enhancement of optical network logical design” (SHIELD), hosted by the KIOS CoE. Its main objective was to provide flexibility in the utilization of resources in order to minimize the capital and operational expenditures (capex/opex) of the backbone optical networks, such as monetary cost and power consumption, while at the same time offering network security against physical layer attacks.

The research quality and importance of the scientific output of his work is reflected by his publications at a large number of quality journals and international conferences in the area of optical networks. Dr. Manousakis has received a number of awards including a best paper award at CRITIS’2013 and an IEEE/OSA Journal of Lightwave Technology outstanding reviewer award (2016). Dr. Manousakis is a Marie Curie Fellow, as well as an IEEE Senior Member.

The Award Ceremony for the Cyprus Innovation and Research Awards 2018 took place on November 26th 2018, at the Cyprus Theatrical Organization premises in Nicosia and the awards were presented by H.E. the President of the Republic of Cyprus, Mr. Nicos Anastasiades. The event was co-organized by the Cyprus Research Promotion Foundation and the Cyprus Employers & Industrialists Federation (OEB), with the support of the Ministry of Energy Commerce Industry & Tourism (photo 1).



KIOS Researchers win competition at the “FIWARE ICT Challenge Vienna”

Marilena Chrysanthou, Philokypros Ioulilianou and Maria Tziakouri, researchers at the KIOS CoE, won one of the FIWARE ICT Competition Challenges Vienna (Smarter Together – Gamification for Citizen Engagement), for their intelligent app “Edutravel” (Education and Travel).

The KIOS CoE team developed a gamification app that motivates people to use environmentally friendly solutions for travelling in their daily life. By using the app, citizens have the opportunity to travel to their destination by various ways including public transport, walking, or car sharing and at the same time learn about their city, its culture and be awarded! The award scheme will be based on points and when citizens collect a specific number of points, they will be able to exchange them for free public transport tickets or for getting ticket discounts. Using this app, CO2 emissions will be reduced and people will live a healthier life as their city will be greener.

The FIWARE ICT Challenge Vienna was a side event of the 2018 ICT Conference, which took place in Vienna from 4-6 December 2018 and attracted more than 6.000 researchers and innovation leaders (photo 2).

Honorary distinction for KIOS researcher in the field of Emergency Response

Dr. Panayiotis Kolios, a Research Associate at the KIOS Research and Innovation Center of Excellence of the University of Cyprus, has received an Honorary Distinction by the EU Civil Protection Mechanism for his valuable contribution to the successful implementation of the “Assessment Mission Course” training program. The honorary distinction was awarded by the Commissioner for Volunteerism and Non-Governmental Organizations of Cyprus, Mr. Yiannis Yiannakis.

Dr. Kolios has extensive experience in the use of Unmanned Aerial Systems (UAS) and is considered to be a leading expert on UAS applications in emergency management systems. He has carried out a number of training activities at national, European and international level receiving remarkable praise (photo 3).

The KIOS CoE team developed a gamification app that motivates people to use environmentally friendly solutions for travelling in their daily life. ””



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Outreach Activities

The KIOS Research and Innovation Center of Excellence is committed to making its research activities and results accessible to its stakeholders, partners, and the general public. To this end, KIOS places special emphasis on communication and dissemination activities in order to encourage people to understand and appreciate the multiple benefits of research and innovation within society.

For the year 2018, the Center's outreach activities included:

“ KIOS places special emphasis on communication and dissemination activities in order to encourage people to understand and appreciate the multiple benefits of research and innovation within society

- International Conferences
- Undergraduate Research Opportunities Program
- School visits
- Researcher's night
- Newsletters
- Media publicity

Conferences

During 2018, the KIOS CoE successfully organized two international conferences in Cyprus: the 16th European Control Conference (ECC) and ENERGYCON. The aim of both conferences was to attract academic and industrial professionals, scientists, professional engineers and engineering students from all over the world and give them the opportunity to present and publish their work, discuss, exchange ideas and knowledge as well as create networks for future collaborations.

This initiative helps to increase the reputation of both KIOS CoE as a center that conducts excellent research, and Cyprus as a country with an ideal environment for conducting high-quality research (photos 1-2).



Undergraduate Research Opportunities Program

The KIOS CoE organized the prestigious Undergraduate Research Opportunities Program for young students for the 10th consecutive year. In 2018, KIOS accepted eight students into the program.. The selected students had the opportunity to work with KIOS faculty and researchers on innovative research projects (photo 3).

School Visits

The KIOS CoE encourages school visits to its premises, where young students are given the opportunity to meet researchers and learn about the research and technology being undertaken at KIOS. A number of KIOS Researchers have also given lectures to pupils at schools in various areas of Cyprus (photo 4).

Over **300**
STUDENTS LEARNED
about the
RESEARCH and
TECHNOLOGY
being undertaken
at KIOS



Outreach Activities



Newsletters

The KIOS CoE Newsletters, entitled “eNews” are circulated to over 1000 scientists, public bodies, collaborators and key decision makers in Cyprus and abroad. The aim is to provide readers with the latest information regarding the scientific activities of the Center. If you wish to receive the KIOS CoE newsletter you can send an email to kiosnews@ucy.ac.cy

Media Publicity

The research activity undertaken at KIOS CoE has been widely published in the printed and electronic media. This includes a number of articles in newspapers and websites with large readership numbers. Additionally, KIOS maintains pages in social media (Facebook, Twitter, LinkedIn and YouTube) in order to disseminate information regarding its research activities.

Researcher’s Night

The KIOS CoE participated in the 2018 Researcher’s Night with 8 activities and 30 researchers. During the event, people of all ages had the opportunity to test their knowledge and experience on water-related topics, travel to different European cities through light paths, learn interactively about renewable sources, reveal a secret message, examine a robotic exoskeleton arm, and discover how a drone is trained to see and understand objects and people in real time!





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The KIOS Center of Excellence project has received funding from the Government of the Republic of Cyprus through the Directorate General for European Programmes, Coordination and Development.

Complementary funding for the KIOS CoE is also provided by the University of Cyprus and Imperial College London.