

2022

ANNUAL REPORT

INSTITUTE OF INFORMATICS & TELECOMMUNICATIONS

From Digital Culture to AI Ethics and 6G: IIT progresses and broadens its impact, meeting research and societal challenges

The year 2022 concludes with the implementation of our strategic plan for 2019-2022. During this period, progress on all pillars entailed on the strategic plan was significant. As noted during the recent Institute evaluation for 2018-2021, "IIT underwent a remarkable modernisation of its research, commercialisation, marketing and management strategies and processes, significantly broadening its outreach and impact". In 2022, IIT experienced its best year ever in terms of attracting funds from various sources, with EU projects remaining the main source, and with national and industrial projects contributing substantially to the overall revenue. Intra-Institute collaborations were strengthened, and are expected to expand further in the future, as solutions combining Artificial Intelligence and Advanced Telecommunication Networks gain growing interest. Synergies with other Institutes within NCSR Demokritos were also reinforced through several research projects and initiatives, in the domains of health, materials, energy and environment.

Among the year's highlights, IIT participates and co-defines the agenda for the evolution of the European AI landscape via projects related to the European AI-on-demand platform (AIoD). IIT's ahead Digital Innovation Hub (DIH), coordinates the largest European DIH (EDIH) of the country, SmartAttica. IIT coordinates and participates in pioneering European research projects on 6G networks, secure frameworks for IoT, edge and cloud resources, as well as, in several European initiatives in security and defense.

But what characterises 2022 is our novel applications in Culture, in collaboration with the Hellenic Ministry of Culture and Sports, the Aylon Lyceum and the archaeological space of the Lyceum of Aristotle. The Aylon Lyceum is housed in the building of the Athens Conservatoire, in the heart of Athens. In this space, the Institute has implemented an interactive digital exhibition where philosophical ideas of ancient Greek philosophers are revived using cutting-edge technologies such as smart interactive digital walls, data collection and content management tools to improve user experience. Aylon Lyceum will be open to the public in October 2023. Adjacent to Aylon Lyceum, is located the archaeological site of the Lyceum of Aristotle. In this emblematic space for humanity, IIT together with Foster+ Partners and The World Human Forum set up a proposal for a novel visitor experience that can also be applied in other open archaeological sites. Our proposal was approved by the Central Archeological Council, and we are currently working on its detailed design and implementation, aiming at setting up a Philosophy Hub in the centre of Athens.

This work, which brings together a multidisciplinary team of philosophers, social scientists, museologists, computer scientists, and others, is



very much related to our latest initiatives on AI and Ethics. We recently set up AI Politeia, a multidisciplinary research group on responsible, trustworthy, and democratised AI.

2022 has also been a milestone year for IIT, initiating coordinated efforts towards a culture of equal opportunities and promoting diversity and inclusivity. In full alignment with the NCSR policy on gender equality, IIT set up a series of actions to address tackling unconscious bias and stereotypes in recruitment, achieving equality in job retention and career development, diversifying leadership, and ensuring accessibility for all.

Our main objective for the forthcoming period is to further promote Research Excellence, building on the created ecosystem and processes. The updated strategic plan for 2023-2026 demands a multi-faceted approach that incorporates infrastructure acquisition, establishment of additional support mechanisms for researchers, provision of incentives for attracting and retaining personnel, and means for ensuring long-term funding and research continuation opportunities. The strategic plan also demands the continuous collaboration and feedback of IIT personnel in all its aspects to meet future challenges.

Dr Vangelis Karkaletsis

Director of the Institute of Informatics
& Telecommunications, NCSR Demokritos

financials

year at a glance



€1.137.684
National Research Grants

€5.714.256
EU Research Grants

€364.332
Other funding

€930.187
Regular Public Budget

255
PEOPLE

113
PUBLICATIONS

24
NEW RESEARCH PROJECTS

30
PHD STUDENTS

12
POSTDOCS & PHD SCHOLARSHIPS

€7.2M
COMPETITIVE FUNDING

30
POSTDOCS



digital culture

The Institute of Informatics & Telecommunications coordinates numerous projects in the digital culture domain and participates in the creation of innovative applications by using cutting-edge technologies such as content management, human-computer interaction, audio analysis and music information retrieval.

digital culture



AYLON LYCEUM

Where intangible ideas become experiences

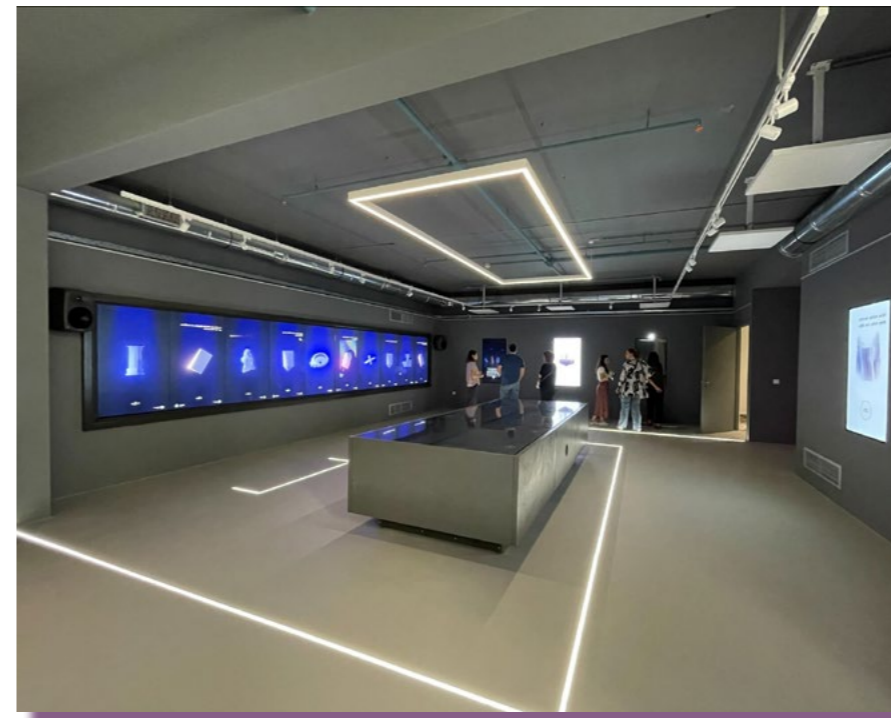
The Institute of Informatics & Telecommunications of NCSR Demokritos (NCSRDI), in collaboration with the Hellenic Ministry of Culture and Sports, developed Aylon Lyceum, a space fostering new ways to exhibit the intangible. The name Aylon Lyceum demonstrates the notion of visualising the immaterial (in Greek "aylon") in a place devoted to dialogue and education (inspired by the role of Aristotle's Lyceum in ancient Greece).

The Aylon Lyceum is housed in the building of the Athens Conservatoire, in the heart of Athens. In this space, the philosophical ideas of ancient Greek philosophers are revived in model exhibitions where visitors engage in a philosophical experience. The exhibits utilise cutting-edge technologies such as smart interactive digital walls, visit customisation tools and applications that collect data which feed back into the experience.

In the first exhibition Eudaimonia meets Democracy in a philosophical group experience. Visitors will reflect on abstract ideas and values and ponder



Aylon Lyceum: digital exhibits



Aylon Lyceum: exploration space

on the ever-present theme of how we can "live well together". Ideas are understood by visitors through personal experience, reflection and decision-making.

Aylon Lyceum, will also host educational programs for schools, talks and special events, as well as experimental art events through synergies with the Athens Conservatoire. We envision this space to serve as a Hub for public dialogue on issues such as the future of Democracy.



Aylon Lyceum: motivation space

digital culture

music & ai



Aristotle's Lyceum

Re-engaging with Aristotle's Lyceum

The Institute of Informatics & Telecommunications of NCSR Demokritos (NCSRDI), Foster + Partners and The World Human Forum in collaboration with Hellenic Ministry of Culture and Sports, have created a proposal for the archaeological site of Aristotle's Lyceum, using cutting-edge technology.

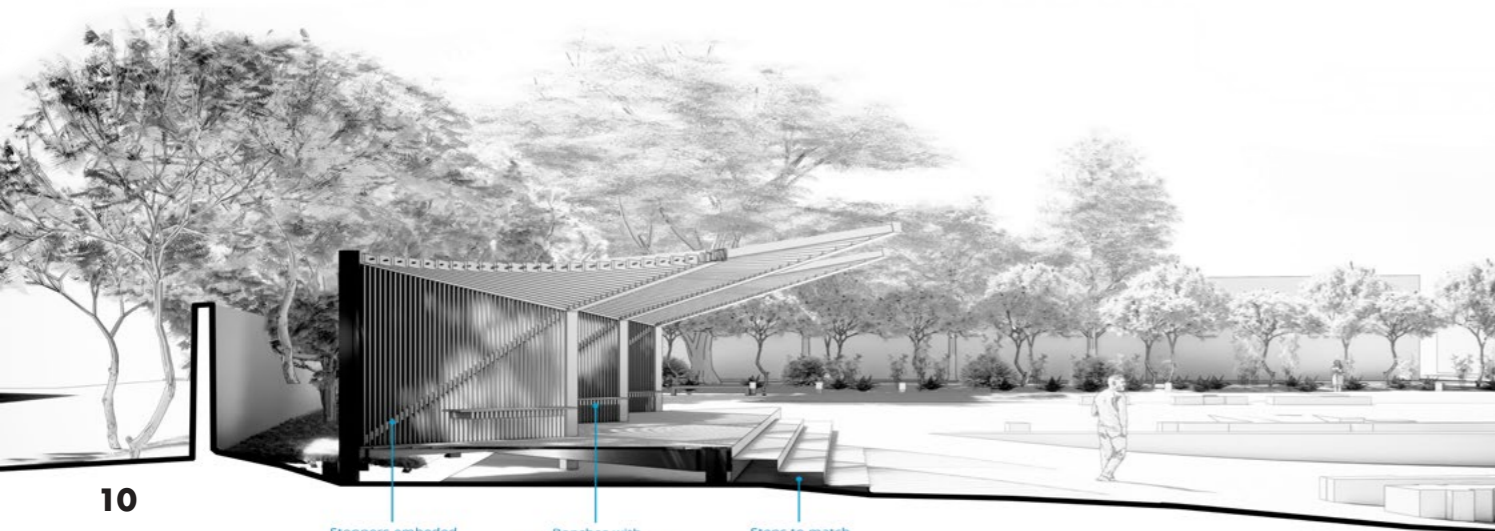
This proposal echoes a mutual interest on how the use of technological innovations can enhance people's engagement with cultural heritage, thus providing a new type of cultural experience.

The proposal that was approved by the Central Archaeological Council, concerns a digital experience in Aristotle's Lyceum that revives the life and works of the renowned philosopher. In a timber pavilion, made up of modular parts, visitors will engage in a philosophical and



Aristotle's Lyceum archaeological site

historical experience through the use of digital technologies. Mobile apps will provide additional information, so that visitors can interact with the content throughout their walk, re-enacting the peripatetic school.



During 2022, the Multimodal Analysis Group (MagCIL) has published papers presenting AI methods for analysing cultural content, such as music and movies. Research has been conducted in the direction of automatically recognising emotions related to musical content or camera movements that are related to aesthetics in cinema. In addition, MagCIL participated in an event at the Megaron Athens Concert Hall that included a speech on "Music and AI", accompanied by a concert of experimental jazz and related AI-enhanced visualisations.

Also, 2022 was the beginning of the museek project, coordinated by IIT and MagCIL, that monitors the public performance of music in Greece. This project aims to build an algorithmic pipeline that runs on a small device (such as Raspberry Pi) and monitors songs in spaces such as restaurants, hotels, cafes, clubs and bars. A "public performance" of music is defined in most EU and US countries copyright laws to include any music played outside a small circle of friends and family that occurs in any public place. The two project partners are MagCIL and GEA. MagCIL builds the

core algorithmic infrastructure of the project, utilising its expertise in fields such as audio analysis, music information retrieval and signal processing. GEA is the official music copyright collective management organisation of Greece and is responsible for pricing such businesses that use music.



Artificial Intelligence generated image from a custom generative model trained within MagCIL

SmartSubs

The aim of the SmartSubs project is to develop and improve the existing know-how of automatic speech recognition and to promote research that aligns live oral performances with written subtitles, in order to develop an application which will allow subtitles to be displayed on smart-glasses in theatrical performances and generally live cultural activities. The application creates an innovative way of providing subtitles in live performances that provides uninterrupted viewing of the performance and enhances the viewer's experience compared to hitherto solutions. It is addressed to deaf / hard of hearing and the elderly, making cultural content accessible to people with hearing problems through Greek subtitles in order to combat social exclusion.

digital innovation hub



Smart Attica kick-off meeting

ahedd coordinates Smart Attica EDIH

Smart Attica is the first European Digital Innovation Hub (EDIH) for Artificial Intelligence in Greece operating in three critical business sectors of the Greek economy: Energy & Environment, Supply Chain & Mobility, Culture & Tourism. Smart Attica focuses on the digital transformation of SMEs and public sector organisations and aims to advance their digital maturity. The EDIH offers four types of innovation services: i) test before invest; ii) innovation ecosystem and networking; iii) skills and training; and iv) support to find investment. These services integrate the human-centric ethics-by-design European AI vision and infuse resilience and sustainability considerations. ahedd is also a partner of smartHEALTH EDIH, which offers highly specialised expertise in the flagship areas of precision medicine, cancer, medical image analysis, public sector digitalisation and infrastructure to facilitate the digital transformation of the private and public sectors.



ahedd offers innovative services

By the end of 2022, in its 3 years of operation, ahedd reached approximately 50 industrial national and international collaborations for the development of innovative services and the provision of high-end expertise to support the digital transformation of businesses, exploiting the R&D capacity of IIT's labs and units and ahedd's partnerships. Some of 2022's flagship collaborations are the service provision contracts with the European Commission in the areas of natural language processing and machine learning as well as

the expert support contracts with OTE - COSMOTE in the areas of behavioural analytics and question answering. Additionally, the testbed launched in 2021 with Vodafone as "Giga Campus", now provides new IoT and 5G infrastructures for the demonstration of smart-city solutions to organisations and for R&D experimentation. Finally, the ongoing "1000 Pioneers for AI in Greece" initiative of ahedd reached the UNESCO IRCAI's International list of Top 100 AI solutions for reaching the 17 Sustainable Development Goals (SDGs).



Dr. Denia Kanellopoulou presenting at the Hellenic Responsible Business Awards 2022

ahedd receives a Gold Award

The NCSR - Qualco Fellowship programme was distinguished with the Gold Award in the "Business & Academic Institutions Cooperation" category, at the Hellenic Responsible Business Awards 2022. The programme is a 5-year partnership nurtured by ahedd; it entails research activities in AI with applications in FinTech and proves to be an excellent example of how research and industry can intersect and innovate.

ahedd supports the European & national innovation ecosystems

ahedd actively participates in European digital innovation initiatives that foster piloting, networking and policy-making activities, such as the Big Data Value Association (BDVA), the Digital SME Alliance and European projects, such as EUHUBS4DATA, EUROCC2, DIH-World, DIH4CPS, DIH², i4Trust, SUSTAIN Euroclusters. At national level, ahedd coordinates joint activities with various key stakeholders in order to exchange best practices, avoid duplication of efforts and perform better targeting in the respective strategies.



ahedd's plans for 2023

ahedd aims to become NCSR's digital innovation vehicle. In 2023, ahedd aims to i) develop a solid yet flexible structure for its operation; ii) play a significant role in EDIHs; iii) develop innovative AI products that exploit cutting-edge research results that tackle business and societal needs; iv) expand the smart-city test-bed; v) connect to policy-making stakeholders and perform targeted networking. ahedd's activities will further contribute to the digital transformation of Greece and the strengthening of the economy at both local and national levels.

More info: ahedd.demokritos.gr



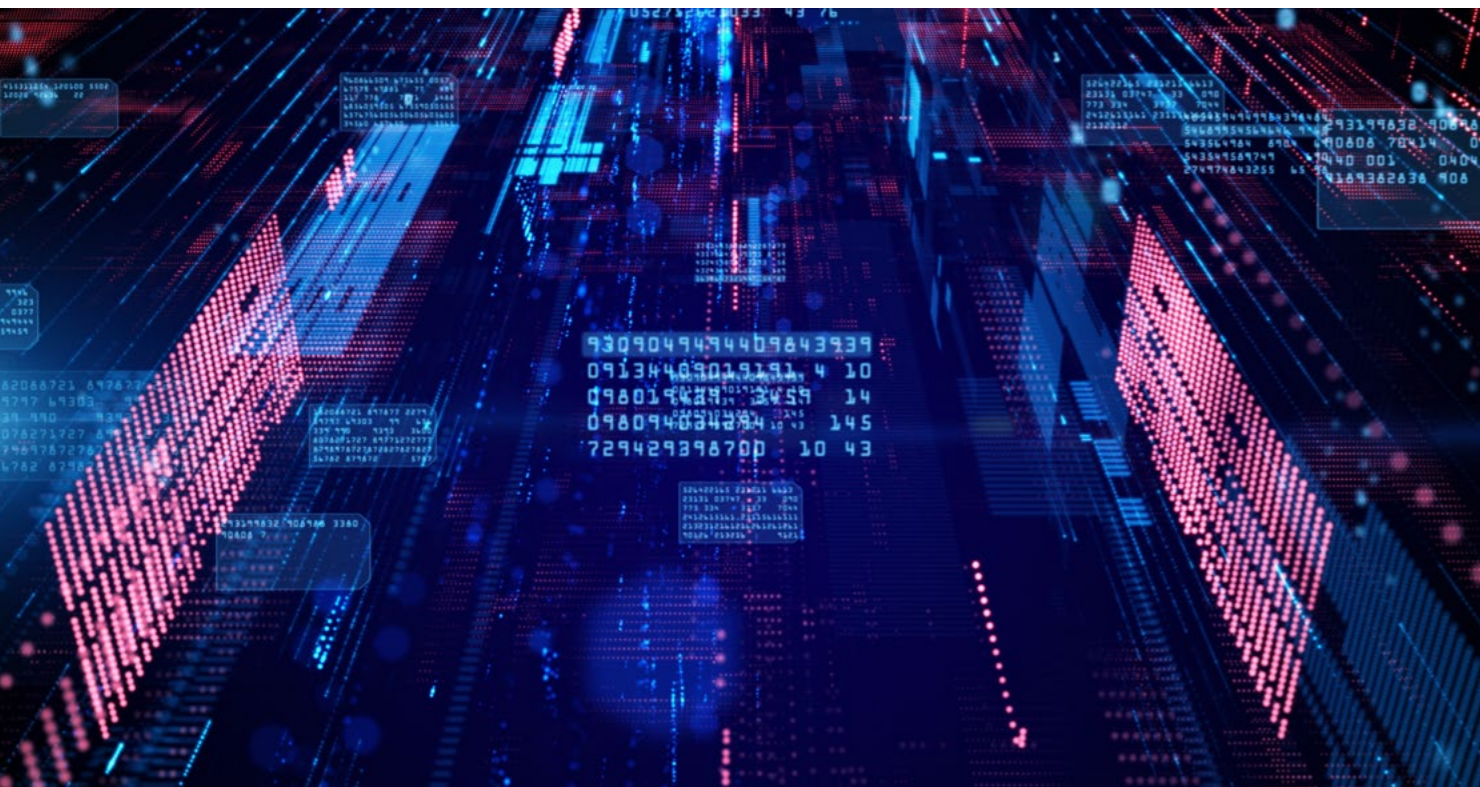
digital infrastructure

eGov office

Network Operations Center

Since its inception in the mid-1980s, the Network Operation Center (NOC) has consistently pioneered and propelled the evolution of the Internet in Greece. Tasked with the essential mission of providing network connectivity, security, and core network services, the NOC has faithfully catered to the needs of the expansive NCSR Demokritos (NCSR D) campus. Its operational responsibilities include the management and maintenance of the campus's core network infrastructure. In addition the NOC actively facilitates research and development by offering consultations, designing, and deploying bespoke network infrastructures, and utilising innovative technologies to create tailored solutions.

The NOC is steadfast in its commitment to amplify its twin foundations of operational distinction and pioneering research. In alignment with this vision, the NOC is set to absorb a portion of the current research efforts undertaken by the Media Networks Lab (MNL) along with key personnel. This strategic manoeuvre serves to establish a new research group, christened as the Smart Networks and Cyberdefence (SNC RG). Our ambition is for the NOC to continue providing cutting-edge services to our users while leading the charge in network research and development.



One of the most noteworthy activities of the NOC, in collaboration with the Infrastructures Team of the eGovernance Office, has been the deployment of a new campus-wide network infrastructure in the frame of project HEPHAESTUS. The deployed infrastructure covers both wired and wireless networks as well as telephony service. This initiative showcases the commitment of the NOC to maintain cutting-edge technology, ensuring efficient, secure, and high-performance connectivity within the NCSR D campus. Yet another significant accomplishment is the successful procurement of funding for several high-profile projects under the provisions of EDF (European Defense Fund) project, SNS (Smart Networks and Services) Security Project for 6G evolution, Horizon Europe Data projects for the realisation of Cloud Continuum, Meta Operating Systems, and swarm intelligence.



Georgios Xilouris
Head of Network Operations Center

More info: iit.demokritos.gr/noc/



The Application Design & Development Team receiving the award



This is a milestone year for the eGovernance Office and its Applications Design & Development Team. The Team received the silver award in the Digital Governance Awards for 2022 for the "Best Practice Idea" in the category "Public and Local Government Administration".

The Team participated in the contest with the Rview Platform, which they designed and implemented to support the evaluation process of all Greek Research Centres for the period 2018-2021. This is the first time that such an evaluation process is implemented with a computational platform. The whole process was specified and monitored by the National Council for Research Technology and Innovation (ESETEK) along with the General Secretariat for Research and Innovation (GSRI).

Throughout the evaluation process, the Team provided training and support to all the Research Institutes, as well as to ESETEK members and GSRI officers. It must be noted that Rview will continue to be used in future evaluations, and will act as a repository in the annual updates of the information for each Institute.

Another significant achievement of the Team was the implementation of the Rview Statistics platform, which provides visualisations of all collected data (e.g. personnel, financial data, bibliographic data etc.) for the country's Research and Innovation Ecosystem, through a user-friendly interface. This is a tool for researchers, Institute Directors, and policy makers to support decision making.

The next milestone product for the Team is the unified eGov platform for NCSR Demokritos (NCSR D). This is under development and is scheduled to go live by the end of 2023. The platform will offer a one-stop-shop service for the Centre's online services used by personnel through a single sign-on. The Applications Design & Development Team is closely collaborating with the Help Desk Team of the eGovernance office. The Help Desk was recently set up to support NCSR D personnel in the computational services provided.



Team Lead with the Minister of Digital Governance



Letteris Koukianakis
Team Lead at Application Design & Development Team, eGovernance Office, NCSR Demokritos

24 new research projects 2022

In 2022 the Institute of Informatics & Telecommunications attracted 24 new research projects



AI4EUROPE
An AI-on-Demand Platform to support Research Excellence in Europe
Horizon Europe - SKEL | The AI Lab
1/7/2022 - 31/12/2025
NCSRD budget: 547,500€
ai4europe.eu

Pre-PAI
Preparation of the development of the AI-on-Demand Platform
DIGITAL-CSA - SKEL | The AI Lab
1/11/2022 - 31/7/2023
NCSRD budget: 13,375€



EVENFLOW
Robust Learning & Reasoning for Complex Forecasting
Horizon Europe - SKEL | The AI Lab
1/10/2022 - 30/9/2025
NCSRD budget: 727,500€
evenflow-project.eu



DIH4CPS
DIHs for Embedding Interoperability in Cyber-Physical Systems of European SMEs
H2020 - SKEL | The AI Lab - ahedd
1/3/2022 - 31/10/2023
NCSRD budget: 20,000€
dih4cps.eu



i4trust
Data Spaces for effective and trusted data sharing
H2020 - SKEL | The AI Lab
24/1/2022 - 24/10/2022
NCSRD budget: 7,500€
i4trust.org



museek
Automatic music monitoring of public performance
National projects - CIL
4/8/2022 - 31/12/2023
NCSRD budget: 195,125€



ENEXA
Efficient Explainable Learning on Knowledge Graphs
Horizon Europe - SKEL | The AI Lab
1/10/2022 - 30/9/2025
NCSRD budget: 411,258€
enexa.eu



FRISCO
Fighting teRrorist Content Online
ISF-PJG - SKEL | The AI Lab
15/11/2022 - 14/11/2024
NCSRD budget: 309,337€
friscopproject.eu



TITAN
AI for Citizen Intelligent Coaching against Disinformation
Horizon Europe - SKEL | The AI Lab
1/9/2022 - 31/8/2025
NCSRD budget: 706,250€
titanthinking.eu

reBook
Digital platform for republishing historical Greek books
National projects - CIL
4/8/2022 - 31/12/2023
NCSRD budget: 20,000€



aerOS
Autonomous, scalable, trustworthy, intelligent European meta Operating System for the IoT edge-cloud continuum
Horizon Europe - MNL
1/9/2022 - 31/8/2025
NCSRD budget: 500,000€
aeros-project.eu



ICOS
Towards a functional continuum operating system
Horizon Europe - MNL
1/9/2022 - 31/8/2025
NCSRD budget: 468,375€
icos-project.eu



Alception
AI Framework for Improving Cyber Defence Operations
European Defence Fund Action - MNL
1/12/2022 - 30/11/2025
NCSRD budget: 478,375€



FaRADAI
Frugal and Robust AI for Defense Advanced Intelligence
European Defence Fund Action - SKEL | The AI Lab | ISL
1/12/2022 - 31/5/2026
NCSRD budget: 600,000€



SUSTAIN
cluSter bUilding SmarT reAdiness INdicators SMP - SKEL | The AI Lab | ahedd
1/9/2022 - 31/8/2025
NCSRD budget: 215,070€



OpenQKD
Open European Quantum Key Distribution Testbed
H2020 - CIL
1/3/2022 - 28/2/2023
NCSRD budget: 68,000€
openqkd.eu



POSITIVE LEARN
Distance learning positification: technostress relief and wellbeing
Erasmus+ - CIL
28/2/2022 - 27/2/2025
NCSRD budget: 57,911€
positive-learn.eu



DRONES@STEAM
Fostering Digital Transformation in VET Schools and creating new job prospects in the labour market
Erasmus+ - NML & Mind
28/2/2022 - 27/6/2024
NCSRD budget: 44,330€
dronesteam.eu



24 new research projects 2022

kick off in 2023

12 new research projects



JOBS4ALL

Strengthening the Employability and Key Competences of Young People with Disabilities Through the Digital Transformation and Modernisation of Youth Work
Erasmus+ - NML & Mind
2/5/2022 - 1/5/2024
NCSRD budget: 58,800€
jobs4all-project.eu



SCIBIO

SCience outreach: The example of BIObanks in Europe
Erasmus+ - CIL
15/12/2022 - 14/6/2025
NCSRD budget: 53,539€
scibioeu.eu



Business People in Green Dialogue

Knowledge Valorisation and Awareness Dialogue among Business People and Newcomers for a Resilient Green Development
Erasmus+ - CIL
31/5/2022 - 30/8/2023
NCSRD budget: 7,010€
greendialogue.org/



SmartAttica

SmartAttica DIH, the Attica region Greek Innovation hub for Artificial Intelligence in Energy and Environment, Supply chain and mobility, Culture and Tourism
DIGITAL - SKEL | The AI Lab - ahead
1/1/2023 - 31/12/2025
NCSRD budget: 1,330,433€
smartattica.eu



SmartHealth

European Digital Innovation Hub for Smart Health Precision Medicine and Innovative E-health Services
DIGITAL - SKEL | The AI Lab - ahead
1/1/2023 - 31/12/2025
NCSRD budget: 341,865€
smarthealth-edih.eu



CREXDATA

Critical Action Planning over Extreme-Scale Data
Horizon Europe - SKEL | The AI Lab
1/1/2023 - 31/12/2025
NCSRD budget: 794,375€
crexdata.eu

ThinkUp!

Σύστημα αξιολόγησης και εξατομικευμένης εξάσκησης γνωστικών δεξιοτήτων μέσω παιχνιδιοποίησης για την προαγωγή της νοητικής ανάπτυξης και υγείας σε παιδιά
National projects - ISLab
9/12/2022 - 31/12/2023
NCSRD budget: 113,750€



GATEKEEPER

Smart Living Homes - Whole Interventions Demonstrator For People At Health And Social Risks
H2020 - CIL
6/1/2022 - 17/4/2023
NCSRD budget: 100,000€
gatekeeper-project.eu



HARMONIZE

Towards harmonisation in licensing of future nuclear power technologies in Europe
Horizon - Euratom - SKEL | The AI Lab
1/6/2022 - 31/5/2025
NCSRD budget: 249,375€
harmonise-project.eu



AI4TRUST

AI-based-technologies for trustworthy solutions against disinformation
Horizon Europe - SKEL | The AI Lab
1/1/2023 - 28/2/2026
NCSRD budget: 625,000€
ai4trust.eu



MALT-P

Machine Learning Automated Test Processes Collaboration with Private Sector - SKEL | The AI Lab
12/1/2023 - 12/6/2024
NCSRD budget: 70,103€



EuroCC 2

National Competence Centres in the framework of EuroHPC Phase 2
DIGITAL-JU-SIMPLE - SKEL | The AI Lab
1/1/2023-31/12/2025
NCSRD budget: 389,266€



OASEES

Open Autonomous programmable cloud appS & smart Edge Sensors
Horizon Europe - MNL
1/1/2023 - 31/12/2025
NCSRD budget: 835,000€
oasees-project.eu



6G-SANDBOX

Supporting Architectural and technological Network evolutions through an intelligent, secure and twinning enabled Open experimentation facility
Horizon Europe - MNL
1/1/2023 - 31/12/2025
NCSRD budget: 456,250€
6g-sandbox.eu



ETHER

sElf-evolving terrestrial/non-Terrestrial Hybrid networks
Horizon Europe - WiCom
1/1/2023 - 31/12/2025
NCSRD budget: 399,375€
ether-project.eu



PRIVATEER

Privacy first Security Enablers for 6G Networks
Horizon Europe - MNL
1/1/2023 - 31/12/2025
NCSRD budget: 476,625€
privateer-project.eu



Meta Materials

Ανοικτή συνεργασία ανάπτυξης καινοτομίας στον τομέα της τεχνολογίας επικοινωνιών και δικτύων 5G/6G
Collaboration with Private Sector - WiCom
1/2/2023 - 31/1/2025
NCSRD budget: 198,400€



HellasQCI

Deploying advanced national QCI systems and networks in Greece
DIGITAL - CIL
1/1/2023 - 30/6/2025
NCSRD budget: 279,056€
hellasqci.eu

Projects

education

Education holds a crucial position within the Institute of Informatics & Telecommunications' action plan and the Institute has continued to prioritise the development of this pillar in its activities throughout 2022.

One of the main goals for Education is and promote existing initiatives and partnerships. To that end, the Institute collaborates with Greek Universities to offer a wide range of comprehensive joint Master's programmes. These programmes cover various fields, including Artificial Intelligence, Data Science, ICTs and Special Education, Clinical Exercise and Applications of Technology in Health. It is noteworthy that the MSc programmes in AI and Data Science include dedicated courses on ethics, ensuring that students gain a comprehensive understanding of the relevant ethical considerations and regulatory frameworks. Additionally, in 2022, a state-of-the-art interinstitutional MSc programme, the MSc in Quantum Computing and Quantum Technologies, was founded. It is led by the Institute of Nanoscience and Nanotechnology (INN) of NCSR Demokritos (NCSR), in collaboration with IIT and the Democritus University of Thrace. This initiative is closely aligned with the newly established Institute of Quantum Computing and Quantum Technology of NCSR. Furthermore, the 5-year NCSR - Qualco Fellowship programme,



MSc Data Science tutors at the kick-off of the academic year



MSc in Artificial Intelligence 2022 Degree Award Ceremony

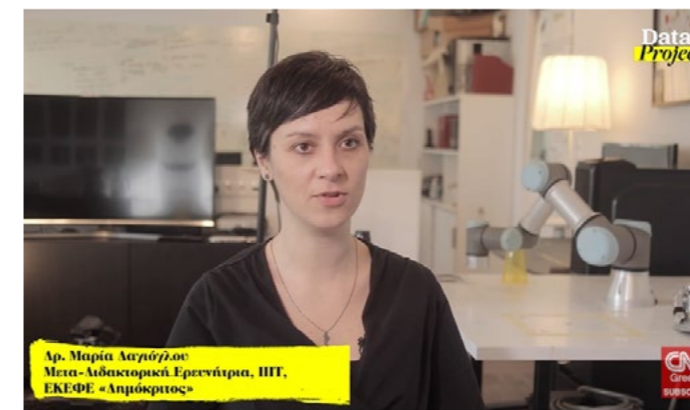
which is the result of the collaboration between NCSR and QUALCO, aims to foster an environment that encourages interdisciplinary research and collaboration between Academia and Industry. The initiative provides a platform for young researchers, graduates, and students to explore research directions and develop innovative technological solutions that address the evolving business needs within the FinTech domain, with a particular focus on leveraging AI. Starting from August 2022, three postgraduate researchers received fellowships.

The focus on education further progressed through the continuation of joint PhD programmes, the coordination of the IS-ENES3 Summer School on Data Science for Climate Modelling in September 2022 and the organisation of educational trainings. These activities include, among others, the NanoAI seminars, which are co-organised by IIT and INN. Additionally, the ahead Digital Innovation Hub continues to offer tailor-made executive training programmes. Lastly, it is important to highlight the Institute's annual participation in the 57th Summer School of NCSR, during which researchers delivered engaging talks covering the full spectrum of the Institute's diverse research domains, including a 5G network programmability training session.

More info: iit.demokritos.gr/about-education/

covering the full spectrum of the Institute's diverse research domains, including a 5G network programmability training session.

communication & outreach



In 2022 the Institute's Communications Team grew bigger with the addition of dynamic and passionate members that have diverse expertise in delivering results in the frame of dissemination and communication activities.

The Team became increasingly involved in additional European and National projects, and continued to lead communication strategies utilising the full spectrum of communication tools and channels available. With the aim to communicate Science and help raise awareness of scientific achievements in the relevant target audiences, the team members continued to work on creating content, branded visual material, infographics, videos, managing websites and social media.

The Team continued to support the Director, the Labs and Researchers, and in many cases, NCSR Demokritos (NCSR) centrally, claiming responsibility for the organisation of high level events, forums, conferences, summer schools, info days and plenary meetings, amongst others. As daily life returned back to normal, in the post-Covid era, the Team put its efforts in bringing personnel together in the workplace by organising scientific talks, and bonding activities including summer parties and festive social gatherings.

Planning ahead for 2023 the Team aims to continue to be the reference point for all the communication and dissemination needs of the Institute and its people with the mission to make Science accessible, engaging, and relevant to all.

More info: iit.demokritos.gr/communications-office



IS-ENES3 Data Science Summer School 2022

ai ethics

diversity & inclusion



Artificial Intelligence (AI) systems have the potential to reshape our lives, our work, our learning, and interaction patterns. AI is able to realise tremendous benefits for economic growth and prosperity for our societies and our planet, by providing solutions to a wide range of societal, health and environmental challenges. At the same time, AI entails numerous potential risks related to discrimination and intrusion, as well as individual and collective social harms and the loss of liberty and autonomy, among others. However, the ability of AI to realise its full potential, depends on the way that we will choose to seize this opportunity and address the challenges of this technological revolution at a national and global level.

The responsible and trustworthy development, deployment and utilisation of AI systems are essential to ensure its positive impact on society. It is important to ensure that these technologies are designed in a manner that aligns with our values and moral principles, such as fairness, democracy, privacy, and societal well-being. Furthermore, by adopting responsible AI development practices, such as ethical frameworks, robust data governance, and human-centric design, and ensuring trustworthiness through explainability, auditing, and monitoring, as well as appropriate legal frameworks we can promote the responsible and trustworthy use of AI.

NCSR Demokritos (NCSR) and the Institute of Informatics & Telecommunications with its long history in Informatics, has always played a pivotal role in related AI research. IIT actively contributes to key initiatives in the area of responsible and trustworthy AI, such as the UNESCO's first global framework for the ethical use of AI, the AI4People initiative, as well as the National AI Strategy for Greece (Democratising AI white paper). While it collaborates with leading organisations such as the IEEE Standards Association for the promotion of ethics in AI and the certification of AI systems. IIT offers dedicated educational programs and courses in the area of ethical and



NCSR and IEEE Standards signing the MoU

trustworthy AI aiming to support the higher and industrial education landscape.

Striving for an AI ecosystem rooted in ethical principles and appropriate legal frameworks that will contribute to a future where AI systems serve humanity in a fair, accountable, and beneficial manner, IIT has formed the AI Politeia Lab with a two-fold research and innovation mission: (a) to conduct multi and interdisciplinary research aiming to foster ethical, trustworthy and democratised AI [‘ethical AI Intelligence’] that embodies our values and respects our human rights, examining at the same time emerging policy perspectives; and (b) to develop and implement ethical, trustworthy AI methods [‘ethical AI Infrastructure’] for diverse industrial contexts and application domains. Empowering this way, a technological future that is reliable, responsible and democratic for our present and future societies, respecting the values, rights and well-being of people and nature.



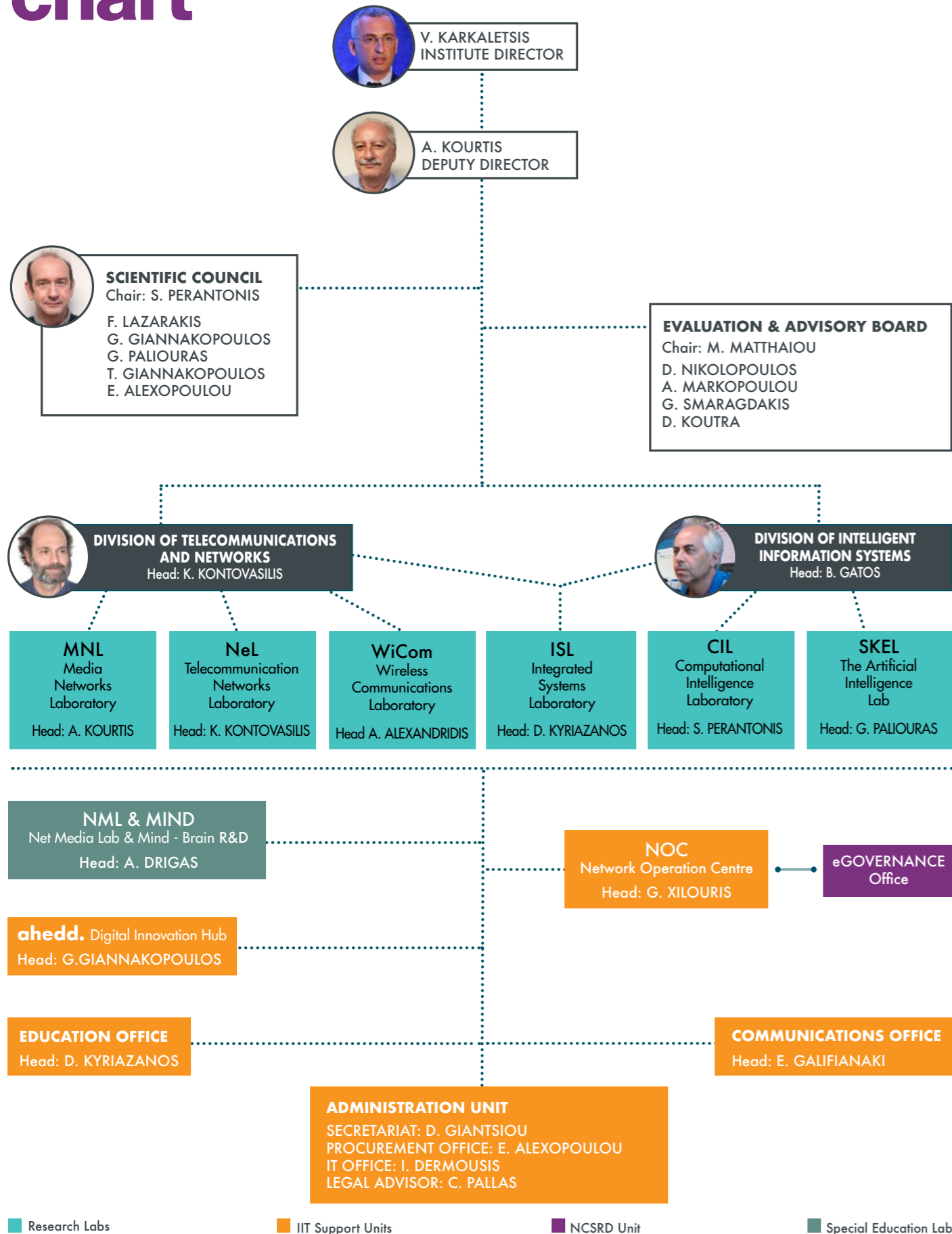
Anti-Discrimination Committees of thirteen Greek research centers & independent research institutes, but also in the multi-stakeholder initiative “Greek Innovation Lab for Women” (#GIL4W), that aims to promote research, innovation, and entrepreneurship of women in Greece.

In full alignment with the NCSR policy on gender equality, this year IIT also developed a series of targeted strategic actions regarding critical equity, diversity, and inclusion issues, such as tackling unconscious bias and stereotypes in recruitment, achieving equality in job retention and career development, diversifying leadership, and ensuring accessibility for all. These actions include several awareness, training and educational initiatives related to preventing and combating a broad range of commonly occurring forms of discrimination in the workplace. The application, monitoring and evaluation of the IIT strategic actions will be held by an internal multidisciplinary working team.

Overall, IIT has prioritised the integration of equity, diversity and inclusion into the policies, structures, practices, mindsets, and decision-making processes of the Institute, while these values remain key determinants of its results in the fields of research, innovation, and education. IIT strives to be a substantially equitable and inclusive workplace and educational environment, where its staff and students can reach their full potential and thrive.

2022 has been a milestone year for initiating coordinated efforts towards enhancing a culture of equal opportunities and promoting diversity and inclusivity in every aspect of IIT’s internal workings, as well as in most of its research, training, and outreach actions. Many Institute members started participating in the implementation of the 1st Gender Equality Plan of NCSR Demokritos (NCSR) for 2022-2024, which encompasses activities concerning gender balance in leadership and decision-making, gender equality in recruitment and career development, integration of the gender dimension into research and teaching content, work-life balance and organisational culture, and takes measures against gender-based violence and discrimination. Further, the Institute was actively involved in the proceedings of the newly established Network of Gender Equality and

organisational chart



scientific boards

The Evaluation & Advisory Board of IIT

The Institute's new Evaluation & Advisory Board, set up in 2022, is composed of five distinguished researchers in fields relevant to IIT's research areas.

Michalis Matthaiou
Chair of the Board
Queen's University Belfast, UK

Dimitrios Nikolopoulos
Virginia Tech,
USA

Athina Markopoulou
University of California
Irvine, USA

Georgios Smaragdakis
TU Delft,
The Netherlands

Danai Koutra
University of Michigan,
USA

The Scientific Council of IIT

The Scientific Council of IIT consists of Researchers and key personnel who meet regularly so as to discuss current issues of the Institute that require strategic decisions.

Stavros Perantonis
Chair of the Council

Fotis Lazarakis

Evangelia Alexopoulou

George Giannakopoulos

Thodoris Giannakopoulos

George Paliouras



As a member of the National Commission for Bioethics & Technoethics, IIT Director contributed in the Commission's recommendation for tackling disinformation and misinformation during the pandemic crisis of Covid-19.

ESETEK - National Council for Research, Technology and Innovation

As a member of ESETEK, the IIT Director, took over the responsibility for the design, implementation and use of the RView computational platform for the evaluation of Research Institutes and Research Centers in Greece.

IIT strategic plan 2023 - 2026



The main objective for the forthcoming period is to further promote Research Excellence, building on the created ecosystem and processes. To accomplish this, IIT's Strategic Plan was enhanced incorporating organisational changes, as well as an action plan for promoting basic research.

The focus is initially on setting up the necessary support mechanisms. During the previous period (2019-2022), IIT established a set of instruments for the horizontal support of activities (Administrative Unit, Communications Office, IT Office, Network Operation Center, eGovernance Office), extended the network and computing infrastructure, along with the building assets, and set up a funding mechanism to support these actions. The challenge for the next period is to build on the existing support mechanisms to facilitate the researchers' daily work and improve the quality of the research outcomes. The significant income which was assured in 2022 through European and national research and innovation projects, enables the Institute to proceed with the following actions:

- Setting up: a Project Management and Proposals Support unit; a Human Resources unit; a unit for handling issues on equality, diversity, and inclusion; a unit for IIT Buildings maintenance and security;
- Expanding the Communications Office and the Education Office.

In parallel, the discussion on the re-organisation of IIT Research Labs, to support research work more effectively has been initiated. This is a necessity since the scientific and industrial landscape in the Institute areas is moving at an incredibly fast pace, with funding schemes,

orientation and application fields rapidly shifting and adapting to global developments. The proposed scenario involves the following actions:

- Maintain the two Divisions: Intelligent Information Systems (IIS), Division of Telecommunications and Networks (T&N);
- Set up a Board for each Division that will monitor the implementation of the IIT research, innovation, and education strategy for the Division;
- Organise Labs in a more dynamic way, in the form of research groups. The aim is to adapt to the dynamic scientific landscape, as well as to give more incentives and roles to younger researchers.

The attraction of talented researchers to support these objectives requires additional effort, exploiting and extending our existing initiatives, such as the joint PhD programmes, the joint MSc programmes, the fellowship programmes. All the above should be accompanied by more focused and well-organised efforts to exploit funding schemes more explicitly directed to basic research, like ERC and Marie Curie programmes.

In its efforts the Institute still must face the long-standing hindrances related to bureaucratic barriers, difficulties to find and retain personnel and have a stable revenue influx. The opportunities that arise from the incredible penetration of AI and broadband networks in everyday life and business, offer on the one hand new opportunities, and areas of interest but, on the other hand, leave an extremely small margin of error and require much faster processes and decision-making mechanisms to avoid being left behind.

our labs



our labs

Computational Intelligence Laboratory

What is your mission as a Lab?

CIL's mission is twofold: on the one hand it focuses on conducting core research in the fields of machine learning, deep learning and multimodal signal analysis (image, music, speech and video analysis, as well as information fusion), while on the other hand the members of CIL participate in building real-world AI applications from various domains: culture, health, environment and AI-driven B2B and B2C applications.

Which of 2022's activities would you like to highlight as the most noteworthy?

The Lab participates in more than 15 research projects, the following started during 2022: FaRADAI (Frugal and Robust AI for Defense Advanced Intelligence, mostly conducting research in the fields of transfer learning and few-shot domain adaptation for military data), Museek (monitoring the public performance of music in Greece, via an AI-powered small device that will be installed in spaces such as restaurants, hotels, cafes, clubs and bars), Ahedd-related projects (various AI projects with the private sector, either in a consulting or a development context, most of them associated to speech analytics and computer vision), reBook (development of a smart digital platform using new techniques and methodologies for text recognition reducing the time and cost of all processes related to the re-publishing of historical Greek books), AI4Geoapplications (investigation of the synergistic use of Earth Observation and Machine Learning in Geological mapping, Hydrogeology, Mineralogy and Disaster Management) and 3 Erasmus+ projects (SCIBIO, SCIENCE outreach: The example of BIObanks in Europe - POSITIVE LEARN, Distance learning positification: technostress relief and wellbeing - Business People in Green Dialogue, Knowledge Valorisation and Awareness Dialogue among Business People and Newcomers for a Resilient Green Development). During 2022, CIL members also strengthened collaborations with medical professionals and major national cultural and environmental institutions.

What are your plans for the future?

In the framework of the planned reorganisation of the Institute at Division level, we intend to strengthen our collaborations within the Institute and contribute to the overall advancement and improvement of its performance. We are also working towards strengthening our position and visibility in our research community by organising several international conferences and other events. We plan to increase our publication rate up to 50 per year by 2025 and our citation rate to 2000 per year. We are also working towards implementing and deploying hardware/software infrastructures and tools that will provide ML services to partners and external users. Additionally, our funding targeting will be towards the EU calls for Culture and Creativity, as we plan to use our ongoing scientific expertise in the fields of document analysis, music information retrieval, image aesthetics recognition and content-based recommendation of multimodal content. Our educational goal is to have six PhDs in the next 4 years, i.e. 1.5 average PhDs per year, a significant increase compared to the previous period. In innovation, our plan is to reach a budget of 100K euros per year from industry corporations, mostly through ahedd DIH. We will continue to expand our focus on applications of multimodal machine learning towards enhancing the accessibility and inclusion in cultural environments.



Computational Intelligence Lab

Computational Intelligence Laboratory



Dr Stavros Perantonis
Head of CIL



Dr Basilis Gatos
Research Director, CIL

More info: iit.demokritos.gr/labs/cil/

Integrated Systems Laboratory

What is your mission as a Lab?

Since its inception in 1999, ISL aims to converge IIT's Informatics and Telecommunications programmes through large scale integrated pilot projects relevant to contemporary and disruptive technologies in research fields with high impact, including physical and cyber security, digital culture, AR/VR immersive environments, and digital simulation. ISL's mission includes a holistic contribution including educational and capability building activities, innovation and focus on application domains with horizontal and significant societal impact, achieved also through crossdisciplinarity and applied extroversive synergies including social sciences and the humanities.

Which of 2022's activities would you like to highlight as the most noteworthy?

In 2022, ISL coordinated popAI project successfully through the first interim review. popAI is the single project of the EU security research cluster addressing, in a dedicated manner, human factors and ethical, societal, legal and organisational aspects of using AI in support of Law Enforcement. EU Green Deal project TREEADS also started in 2022, with ISL being a key research partner involved in climate security, simulation, environmental sensors, ML-based analytics and decision support tools.

During 2022, ISL continued with the evolution of i-Crowd, the group's innovative agent-based simulation, implementing research on hybrid-threat modelling and simulation for cyber-physical resilience as well as behaviour analytics. Regarding digital culture, the efforts to commercialise the COSMOS application, an innovative, non-linear and immersive digital application for presenting the ancient Greek Mythology and Art began in 2022. At the educational pillar, ISL continued the support to the operation of the highly successful MSc programme in Clinical Exercise and Applications of Technology in Health with the department of Physical Education Science of the School of Physical Education and Sport Science of the Democritus University of Thrace.

Finally, at the end of 2022 and after an impressive and pioneering journey of Excellence as a Researcher and former IIT Director, the founder and Head of ISL, Dr Stelios Thomopoulos retired, continuing though his scientific collaboration with ISL. New Head of ISL is Dr Dimitris Kyriazanos, deputy head for the past two years, who successfully passed his tenure review and open evaluation process for Senior Researcher rank in November 2022.

What are your plans for the future?

Key priorities and application areas for the forthcoming period are Security and Cybersecurity including Climate Security and expanding to Defence, applying research on sensors, data fusion and analytics, C2I systems as well as VR/AR/MR & Gamification. At the same time, ISL aspires to expand its roster of PhD, MSc and internship students and improve its bibliometric scoring. Key targets are also the promotion of OCULUS C2I Platform and the provision of services around physical and cybersecurity in the context of IIT Digital Innovation Hub and other innovation -focused actions.



Integrated Systems Laboratory



Dr Dimitris Kyriazanos
Head of ISL



Dr Stelios C. A. Thomopoulos
Founder & Retiring Head of ISL

More info: iit.demokritos.gr/labs/isl/

our labs

Media Networks Laboratory

What is your mission as a Lab?

MNL is one of the most prestigious Labs at national level, having contributed to the introduction and facilitation of new technologies related to telecommunications and smart networking in the Greek community. The main mission of the Lab is the research and development in the fields of Telecommunications (5G, beyond 5G towards 6G), Software and AI-assisted programmable Networks, Cloud Computing and Edge-Cloud Continuum (IoT-edge-Edge Cloud, Swarm Intelligence), Vertical Applications (V2X, UAVs, UGVs) and Cybersecurity. The activities in these fields are currently supported by two research groups, SNC and FRONT. Additionally, MNL research groups deliver educational programmes and workshops actions for the field, and effective innovation and knowledge transfer through the participation in startup accelerator programs at national and European level.

Which of 2022's activities would you like to highlight as the most noteworthy?

In 2022, MNL continued its successful implementation of multiple European and national projects revolving around the evolution of 5G and beyond technologies. Research efforts culminated in the production of publications in esteemed journals and conferences. In 2022, the H2020 aerOS and ICOS projects started, which develop a MetaOS for the provision of IoT-edge-Cloud Continuum, handling the IoT data in a unified way across heterogeneous environments. Furthermore, MNL established and extended numerous relevant technical and infrastructural assets, notably including the EVOLVED-5G Athens' platform, and the 5G mobile platform for mission critical services. MNL also organised the final showcasing event of 5G!DRONES project at the stadium of Egaleo Municipality. During this showcasing event, two demos were presented, namely a Drone Autonomous Flight over 5G, and a UAV-assisted 5G Coverage Extension. Furthermore, in the frame of RESPOND-A project, MNL organised a pilot at the Eleonas area of Egaleo Municipality, which evaluated the performance of RESPOND-A platform in a severe earthquake scenario and demonstrated the rescue of a victim inside a collapsed building and the joined rescue of a victim and a rescuer inside a flaming building, using, among other innovative technologies, a private 5G network.

What are your plans for the future?

The research groups of MNL will continue their research in cutting edge technologies like 6G novel architectures, 6G programmability and integration with native-AI modules for verticals adoption, PAN-European experimentation platforms for 6G systems. Major targets are also the integration of distributed/cloud environments towards a cognitive-driven continuum infrastructure with zero-touch management. Finally, a major goal is the creation of 6G experimentation facilities for industrial stakeholders, SMEs and the academic and research communities, in combination with the evolution of existing infrastructures like the 5GENESIS Athens platform. Following the upcoming restructuring of the Telecommunications Division, the activities attributed to SNC research group, will continue under the umbrella of the Network Operations Center (NOC).



Media Networks Laboratory



Dr Anastasios Kourtis
Head of MNL



Dr Harilaos Koumaras
Associate Researcher, MNL

More info: iit.demokritos.gr/labs/mnl/

Telecommunication Networks Laboratory

What is your mission as a Lab?

NeL focuses on the design, operation, management and optimisation of communications and computer networks, with an emphasis on performance and efficiency aspects. NeL's research involves the formulation of models for evaluating the performance and/or the energy efficiency of networks, or for guiding the design of improved protocols, mechanisms, or processes. A number of important infrastructure-based and infrastructure-less network paradigms are targeted, including Heterogeneous Radio Access Networks, 5G-and-beyond architectures and mechanisms based on SDN and NFV, Cyber-physical systems and IoT networks. Network architectures enabling the distribution of computation and intelligence and network management based on enhanced context awareness and Machine Learning are also in scope.

Which of 2022's activities would you like to highlight as the most noteworthy?

During 2022 NeL maintained its focus on studying various user or device mobility characteristics within evolved wireless networks, also considering particular verticals, such as IoT networks for monitoring and detecting leakages in pipelines. Additionally, NeL explored (in collaboration with MNL) architectural frameworks for the Cloud-Edge-IoT continuum, towards more flexible and efficient Meta-Operating Systems and an optimised management of resources under various IoT use case scenarios. On a related front, NeL contributed to the development of policy recommendations to Think20, an international engagement group for G20, addressing sustainable mobility in smart cities and considering supporting infrastructures, emerging networks, and open secure data. Moreover, the Lab maintained a leading role within π -NET, the Competence Centre on 5G+ networks and advanced enablers for verticals, and participated in working groups for developing the Centre's consolidated 5G+ infrastructure blueprints and for conducting a feasibility study of 5G Non-Public Network deployments, which will shape π -NET's future service offerings to the various vertical market stakeholders. Finally, NeL was an active contributor of services to the scientific community and Lab members were invited to the Technical Program Committees (TPC) of more than ten leading international conferences on networking.

What are your plans for the future?

The domain of future networks presents important challenges, such as the integration of heterogeneous softwarised networks, the move towards autonomous/self-driving networks and autonomous cyber-physical systems, the quest for integrated sensing and communications, and the broader exploitation of AI/ML for network optimisation. In response to these challenges and in alignment with the Lab's profile and expertise, NeL will explore relevant and timely topics related to Heterogeneous Networks, Network Management using AI/ML, Mobile IoT Networks, Computing-aware Networking, and Experimentation on 5G/6G Networking Technologies and Infrastructure for advanced vertical use cases. Topics of broader scope and/or greater complexity are expected to be addressed cooperatively, in collaboration with other peer institutions and/or other Labs within IIT, also leveraging the participation to the Competence Centre π -NET.



Telecommunication Networks Laboratory



Dr Kimon Kontovasilis
Head of NeL

More info: iit.demokritos.gr/labs/nel/

our labs

Wireless Communications Laboratory

What is your mission as a Lab?

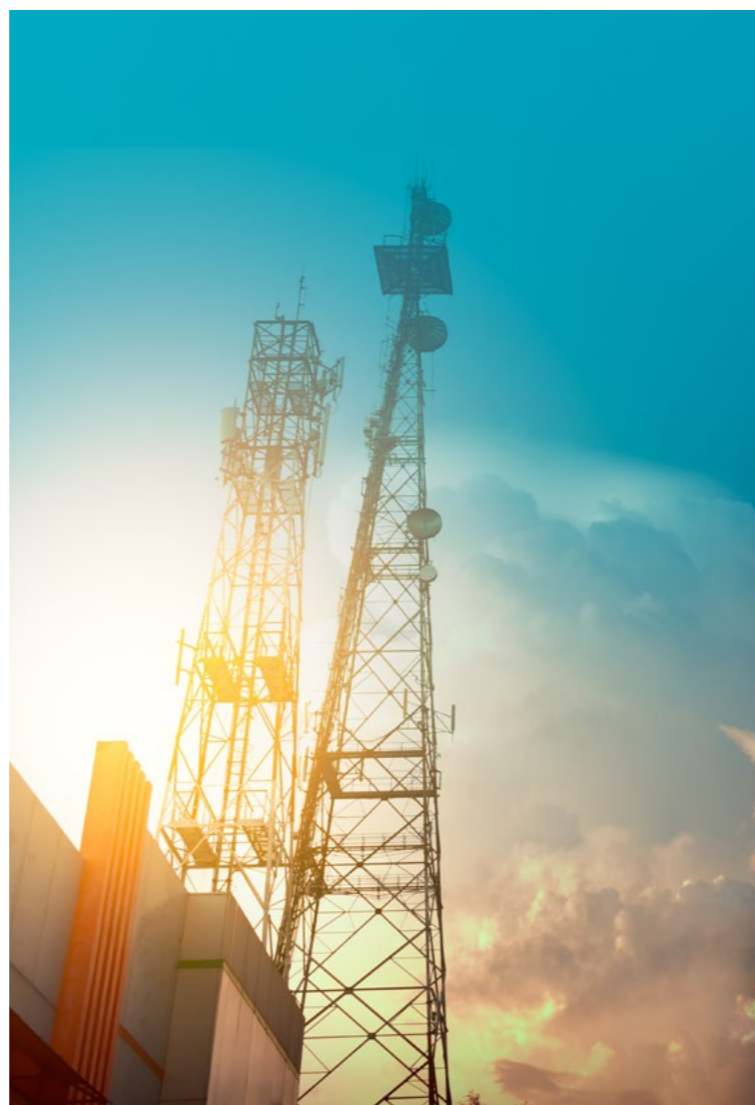
WiCom specialises in electromagnetic radiation aspects, propagation of electromagnetic waves and radio access of various communication systems including advanced transmit/receive techniques and MIMO systems. The Laboratory has long experience in system-level analysis, simulations and development of software tools, antenna design and interaction between antennas and human-body. Recently, special focus is given on antennas with magnetic materials or metamaterials, wearable antennas including design and implementation of textile antennas (suitable for smart clothing).

Which of 2022's activities would you like to highlight as the most noteworthy?

In 2022, WiCom continued its close cooperation with SKEL | The AI Lab under the ARIADNE project, the first initiative within IIT that bridges telecommunications and AI/ML domains in B5G networks. Significant effort was devoted to the study of Reconfigurable Intelligent Surfaces (RIS), a hot topic in wireless communications especially for mmWave networks and beyond 5G technologies. It is noted that an Early Stage Researcher was recruited in the frame of Marie Curie ITN METAWIRELESS to work on the design of RISs. Moreover, channel modelling at the D-band was investigated in depth. Our activity also focused on design of High and Medium gain antennas at D-band (reflector antennas, dielectric Lens antennas) but also at X-band (ESA-DELHILA project). Furthermore, significant research effort was applied in the field of reconfigurable wearable textile antennas (M-REWEAR project). A number of results have been published in international journals (IEEE TGCN) and conferences (VTC2022-Spring, PIMRC2022, Meditcom2022, EUCAP2022, MobiHealth2022, TELFOR2022). Members of the Lab received the Outstanding Paper Award IEEE-ComSoc2020 and gave invited talks to scientific events (PAINLESS 4th Summer-School, MeditCom2022). It is worth noting the successful completion of one PhD supervised by our Lab.

What are your plans for the future?

In the upcoming period, our work will be based on the main research directions of our Laboratory aiming also at further developing our expertise on evolutionary technologies. Specifically, we will exploit our previous work on B5G and 6G systems and technologies especially for mmWave frequencies, Reconfigurable Intelligent Surfaces, PHY techniques and network optimisation based on AI/ML techniques, antenna technologies and wearable textile antennas. WiCom will have the opportunity to work on 6G Terrestrial-to-Non-Terrestrial networks integration through the SNS project ETHER, as well as to closely work together with MetaMaterials Inc. on RISs on the already agreed work-plan. The research activity in the area of wearable textile antennas will continue based on the experience of the previous years and the secured funding until September 2024. In order to attract external funding, we will exploit opportunities under Horizon Europe and especially the Smart Network and Services (SNS) work programme, European Space Agency (ESA), our current collaborations with private companies, Universities/Research Centres as well as upcoming national funding programmes.



Wireless Communications Laboratory



Dr Antonis Alexandridis

Head of WiCom

More info: iit.demokritos.gr/labs/wicom/

Net Media Lab Mind & Brain R&D

What is your mission as a Lab?

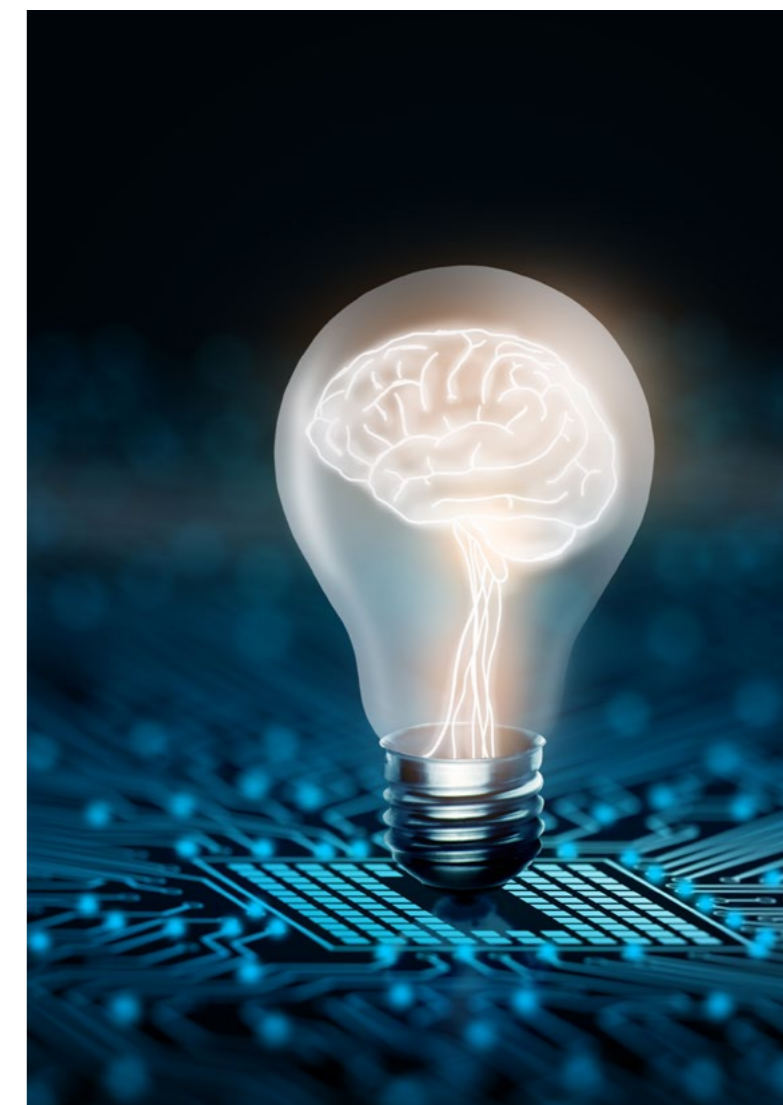
NML's mission focuses on R&D on ICTs mainly within the Education, Inclusion and Skills Improvement domains. More specifically, the fields of Educational Technologies and other closely related fields such as Human Computer Interaction (e.g. e-Learning Environments, AR/VR, Educational Robotics, Games, Mobile Apps, STEAM, BCI, Design4All) form the main R&D areas of NML. The Lab's mission also includes Academic R&D outcomes such as high-quality International publications, postgraduate and PhD degrees as well as other educational activities (e.g. annual seminars) and EU projects. In addition, the Lab targets students in general and special education, adults (women, seniors, disabled, refugees etc.) and other related stakeholders (educators, parents, public administrators, etc.) and offers them education, inclusion and skills improvement on and through digital technologies.

Which of 2022's activities would you like to highlight as the most noteworthy?

During 2022, NML & Mind has conducted its R&D and Education activities under 3 main pillars: EU Projects, Publications and Education. In 2022, the Lab ran 5 Erasmus + projects promoting 21st Century skills (3D2ACT, STEAM4ALL, DigiTeal, JOBS4ALL & DRONES@STEAM), of which: 2 coordinated, 1 successfully concluded and 2 started. Of the several published articles in 2022, 15 were submitted to scientific Scimago rated journals (8 were published and 7 were accepted in 2022 and published in 2023). Furthermore, it continued running its annual seminars and the operation of the "Specialization in ICT & Special Education: Psychopedagogy of Inclusion" postgraduate programme, which runs since 2016 in collaboration with the University of Thrace. In 2022, 97 students graduated, while 200 students were attending the two concurrent academic cycles (100 of which enrolled for the new academic period) and three new PhDs started. In addition, the positioning of the Lab within the global science map evolved and improved. The ResearchGate and Scholar indices increased significantly and several of the Lab's articles and studies have been adopted and included in national educational policy and strategic studies of various Ministries and Governmental bodies in USA, Germany, Sweden, Ireland and 11 South-East Asia countries. Moreover, the ROBOTICS4DEAF project, received a Best Practice award by the EC in 2022. Finally, the Lab was also invited by the Irish Research Council (Laureate Awards) and the Japanese Ministry of the Interior to support and advise them on digital technologies exploitation for adult education and inclusion.

What are your plans for the future?

For the future, the Lab's vision is to enhance, foster and widen on the one hand its R&D activities to improve even more the number and quality of publications and on the other hand its large network of organisations with new entities to promote EU Projects submissions. In addition, it aims to improve the successful run of its postgraduate program and annual seminars and enhance its educational activities in all levels and in new thematic areas, giving emphasis on 21st century skills, contemporary and emerging digital technologies for inclusiveness and equality in education.



Net Media Lab Mind & Brain R&D

Net Media Lab | Mind & Brain R&D



Dr Athanasios Drigas

Head of NML & Mind

More info: iit.demokritos.gr/labs/nml/

our labs

SKEL | The Artificial Intelligence Lab

What is your mission as a Lab?

In an environment where AI is both a “friend and a foe”, SKEL aspires to be a trusted source of AI research and innovation. We strive for a balance between: (a) scientific excellence in selected research areas, through high-impact publications, and involvement in major AI events; (b) a three-pronged approach to education, covering research training of graduate students, skill development for IT professionals, and technological literacy for the wider public; (c) transferring innovation & knowledge to the market, as open-source projects, commercial products, or dedicated start-ups; (d) societal impact, through the democratisation of AI, allowing everyone to benefit from it.

Which of 2022’s activities would you like to highlight as the most noteworthy?

Last year has brought with it the fruits of a conscious and intense effort towards high-quality research and impactful innovation. We initiated 9 new projects, covering intriguing topics and impressive use cases: the new European AI-on-Demand platform, trustworthy misinformation detection, neurosymbolic learning for complex event forecasting, explainable learning on knowledge graphs and detection of online terrorist content.

Additionally, ongoing efforts have resulted in numerous research contributions, including:

- A novel transfer learning method for autoencoders, published at the ACM Transactions on Knowledge Discovery from Data (TKDD);
- Novel work on CRISPR guide RNA efficiency prediction, published in two Nucleic Acids Research (NAR) papers and awarded the Kafatos Prize;
- Significant improvements in our Complex Event Recognition engine, published in the Journal of Artificial Intelligence Research (JAIR) and the Knowledge Representation and Reasoning (KR) conference;
- Novel text mining methods to extract information from financial reports and to predict the success of ongoing clinical trials, based on biomedical publications, both presented at the Conference of the Association for Computational Linguistics (ACL).

Furthermore, we have contributed significantly to various AI-related activities, including:

- Chairing the International Symposium on Temporal Representation and Reasoning;
- Organising a summer school on Data Science for Climate Modeling;
- Funding numerous research projects to develop AI methods for Earth Observation tasks, in the context of the AI4Copernicus project.

Beyond scientific excellence, we had a number of outreach initiatives, including:

- Cultural events across Europe, in the context of the VAST project, studying European values across space and time;
- The development of a physical space for the innovative exhibition on Greek ideas and ancient Greek philosophy, called “Aylon Lyceum” (aylon meaning intangible);
- Contribution to the science communication initiative 1000 Pioneers for AI in Greece.

What are your plans for the future?

The state of the art in AI research is changing rapidly and has a direct impact on the lives of all of us. Being a research team with significant experience and achievements, we are glad to be contributing to this change. We are devoted to quality outcomes and we will seek to intensify our efforts in this direction, both in basic and applied research. At the same time we feel responsible for making sure that the technologies delivered are trustworthy and are used ethically. This is especially true in sensitive areas, such as law enforcement and counter-terrorism, where we are running corresponding projects and expect relevant results. Moreover, we are devoted to the democratisation of AI, and we will carry on our multi-tiered communication and educational activities, in order to make sure that everyone will benefit from the upcoming scientific achievements.



skel
THE AI LAB

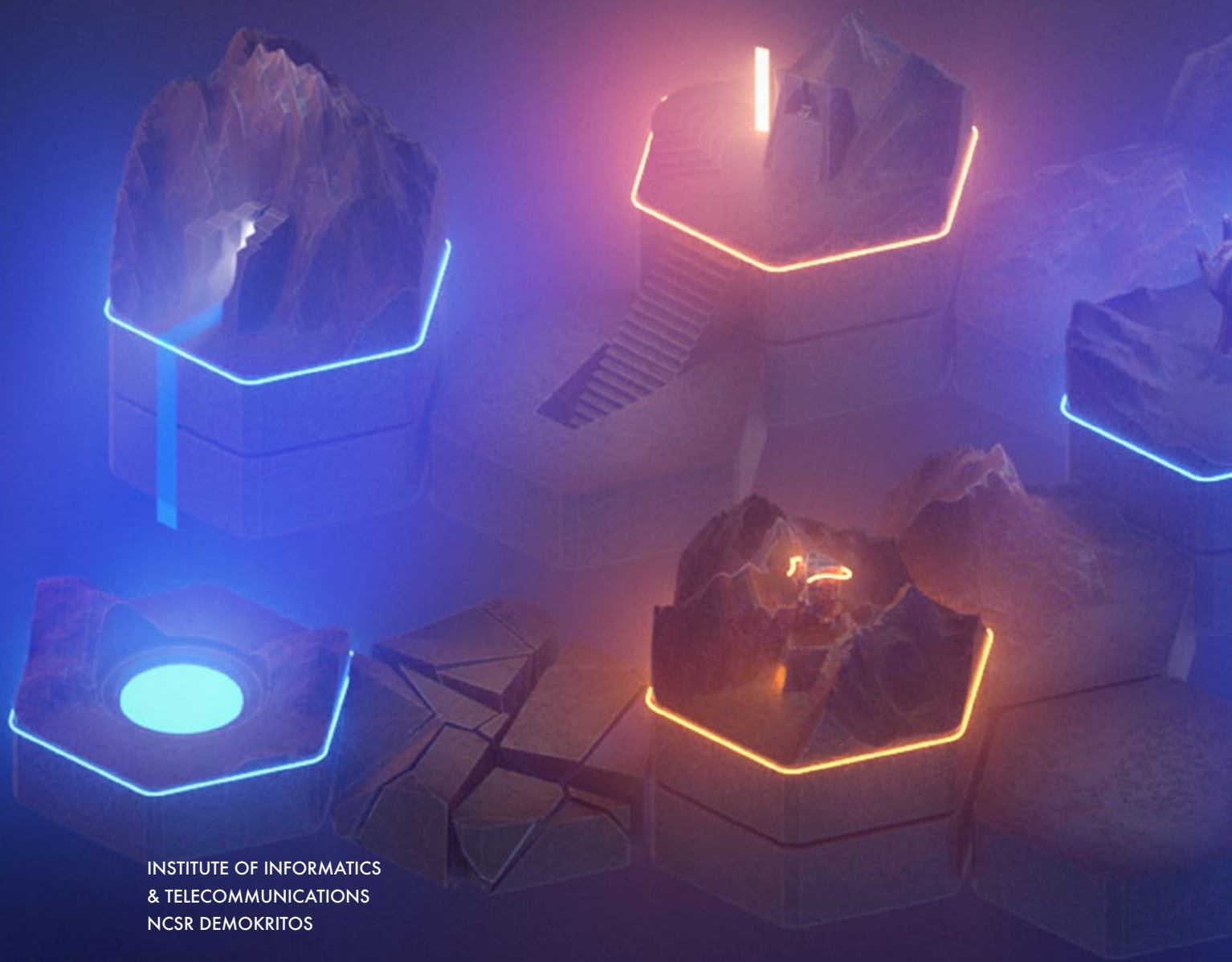
SKEL | The AI Lab



Dr George Paliouras


Head of SKEL | The AI Lab

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