

# CURRICULUM VITAE

## VANGELIS KARKALETSIS

Director of the Institute of Informatics &  
Telecommunications NCSR DEMOKRITOS

Athens, September 2022

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## SUMMARY

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I am a graduate of the Department of Computer Engineering & Informatics, University of Patras (1989), with an M.Sc. in Artificial Intelligence from Queen Mary & Westfield College, University of London (1990) and a PhD in knowledge representation and information extraction from the Informatics & Telecommunications Department, National and Kapodistrian University of Athens (1995).

Following the completion of my M.Sc., I worked for approximately 10 years, in parallel with my PhD studies for some of these years, as a software developer, a lecturer in competence seminars on informatics, and – more importantly – as a research associate in various research and development projects, 2 of which (1997-99) as a post-doc researcher at NCSR “Demokritos”. I was nominated as Researcher for the Institute of Informatics and Telecommunications (IIT) of NCSR “Demokritos” (NCSR-D) in 1999, Senior Researcher in 2003, and Research Director in 2007.

I was elected as Director of the Institute in November 2018 and took over the position in February 2019. During my duty as IIT Director, I served as Vice President of NCSR “Demokritos” for 2 years (July 2020 – July 2022). In my duties as Vice President, I also served as NCSR Director from May 2021 till July 2021. Since December 2019, I am a member of the National Council of Research, Technology and Innovation (ESETEK). Also, since April 2021, I am a member of the National Committee for Bioethics & Technoethics.

My main research directions during the almost 30 years of activity in Artificial Intelligence research are knowledge representation, data management and analysis (initially focusing on text), Human-Computer Interfaces (initially in natural language).

Since the beginning of 2004 and till the end of 2019, I took over the leadership of the IIT “Software & Knowledge Engineering Lab – SKEL”. Due to my duties as IIT Director, I handed over SKEL leadership at the beginning of 2020. During these 16 years, SKEL achieved an explosive growth; from the 6 lab members in 2004, to more than 60. During the 16 years, as the head of SKEL, together with our research, administrative and technical personnel, a growth strategy was designed and successfully implemented based on the following core axes:

- Taking initiatives for the coordination of European and national projects, within the scope of the two core research directions of the lab: (a) retrieval, extraction and fusion of multimodal and multisource information; (b) intelligent and user-friendly human-computer interfaces.
- Training new researchers through PhD and MSc programmes, and postgraduate/graduate theses. This has been performed through several joint PhD programmes with Greek and foreign Universities, cross-institutes MSc programmes with Greek Universities, offering of internships in our R&D projects.
- Strengthening intra-institute collaboration for exploiting complementarities in expertise and strengthening our profile in research consortia.
- Setting inter-institute collaboration within NCSR-D, exploiting the Centre’s multidisciplinary nature.
- Increasing the visibility of the Lab mainly through the organization or chairing of important international and national conferences/workshops, as well as through the participation in standardization bodies and scientific communities.
- Exploiting research outcomes through creating spin-off and start-up companies, collaborating with various Greek and foreign enterprises through “open innovation” R&D collaboration agreements.
- Increasing the outreach activities to the public, through various awareness activities and mainly through school visits in an organised manner which formed the basis for the extensive schools’ visits programme at the whole NCSR-D.

During the last, almost 4 years, as IIT Director, together with IIT personnel, and building on the principles and experiences from SKEL leadership, we managed to set in motion a comprehensive strategic plan based on the parallel and synergetic growth of three pillars (Research, Innovation, and Education) and the establishment of the corresponding support mechanisms for these pillars.

- During this period, the Institute met significant success in attracting research funding from diverse sources, with EU projects remaining the major one, but with national and industrial projects contributing substantially to the overall revenue. Moreover, the period is characterised by the strengthening of the intra-Institute collaborations and the gradual shaping of a common research space, expected to expand further in the future, as solutions combining AI and Advanced Telecommunication Networks gain continuously growing interest. Synergies with other NCSR-D Institutes were also strengthened through several research projects and initiatives, in the domains of health, materials, energy and environment, where the exploitation of AI and big data analytics is growing. Furthermore, IIT contributed its expertise to strategic initiatives and actions with national and European impact, along with Greek and European organisations.
- The Education pillar continued to develop through the joint PhD programmes with foreign Universities, the setup of industrial fellowships, the organisation of summer schools and seminars as well as the expansion of joint MSc programmes with Greek Universities.
- Innovation was the area that met the most drastic changes, due to – on the one hand – the increased focus of the Institute on the pillar and – on the other hand – the significant developments in the management of innovation-centred research at the European level and the changes in the financial and business status of the country.
- At the operational level, the Institute reorganised effectively its structure and put in place the support mechanisms required for ensuring its growth in all strategic pillars. The organisation of strong IT operations, including (a) the setup and management of the NCSR-D eGovernance office, (b) the re-organisation of the Network Operation Center, and (c) the renovation of our network and computational infrastructure, ensure that the Institute is equipped to handle the increased demand set by its central role within NCSR-D. Furthermore, with respect to the building infrastructures, IIT office spaces were expanded and renovated to cover our increasing needs until the construction of our new smart building which is scheduled in 2025.

The following sections present my educational and professional experience (sections 2 and 3), followed by a summary of my research interests (section 4). The coordination of SKEL's research and innovation activities, as well as of IIT education activities is presented in section 5. A summary of my activities as IIT Director is presented in section 6. Section 7 comprises short descriptions of the R&D projects which I have coordinated or participated in a substantial role (coordinator, technical/scientific manager, WP/task leader). My educational activities (organising and lecturing M.Sc. courses, supervising doctoral, postgraduate and graduate theses, supervising internships), are presented in section 8. My scientific publications (editorials, books, journals, conference papers) are referenced in section 9. Section 10 presents information with respect to my scientific credentials (citations, committees, invited talks, conference organisation, conference committees, etc.).

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# PERSONAL INFORMATION



## 1. PERSONAL INFORMATION

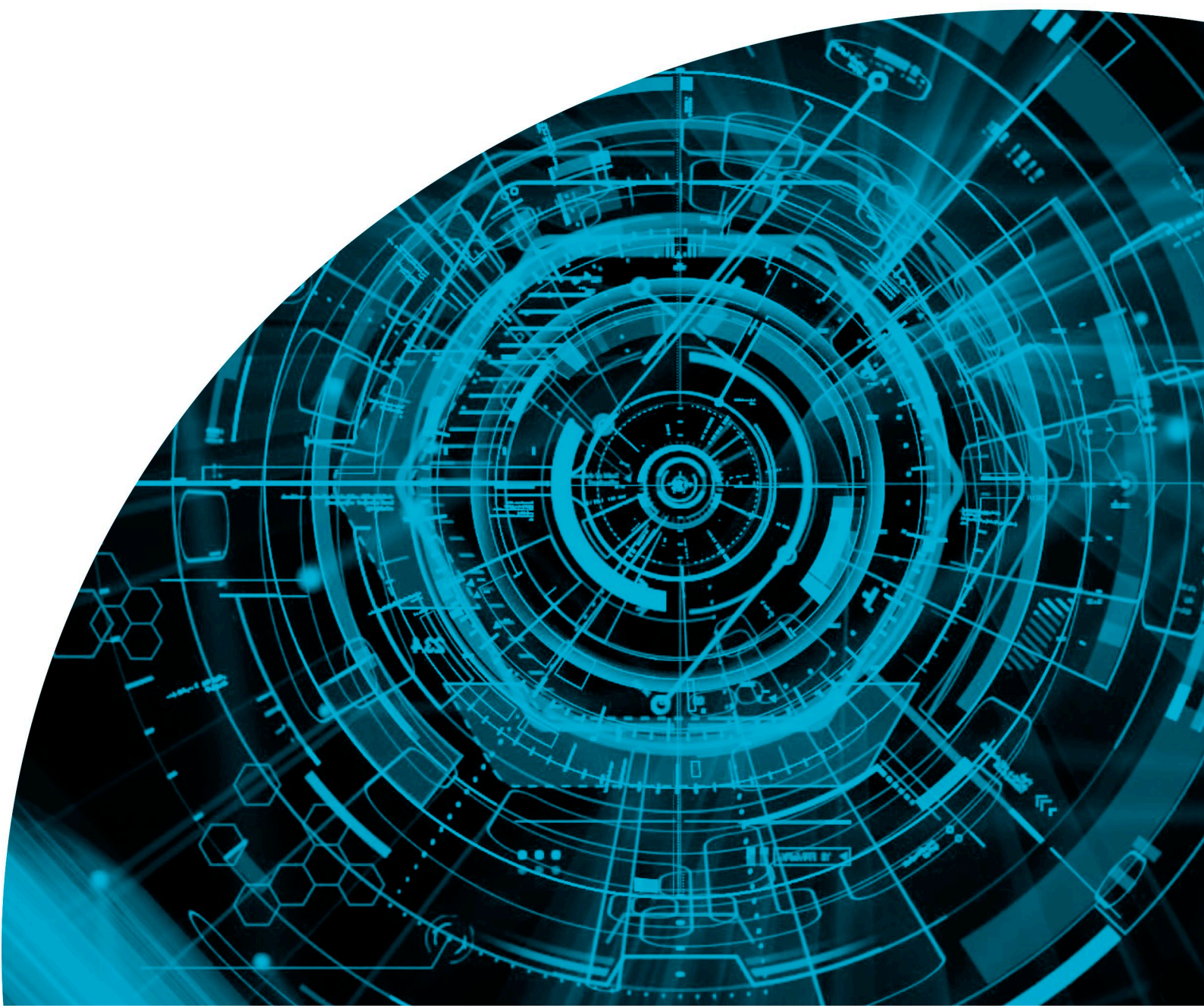
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<b>Given Name</b>	Vangelis
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<b>Residence Telephone</b>	210 685 5737
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# EDUCATION



## 2. EDUCATION

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- **PhD, Informatics & Telecommunications Department, National and Kapodistrian University of Athens – in collaboration with NCSR “Demokritos” (1991-1995).** My PhD focused on the design and development of terminological knowledge bases and their exploitation in multilingual software applications. A novel architecture was designed and implemented, along with a knowledge representation formalism and a methodology for extracting knowledge from textual documents and populating the knowledge base. The thesis results were applied and validated in an application for the dynamic generation of multilingual messages tailored to the needs and expertise of the user (Supervisors: Dr. C.D. Spyropoulos, Prof. C. Halatsis).
- **Master of Science (M.Sc.) in "Advanced Methods in Computer Science", Queen Mary & Westfield College, University of London, UK (1989 - 1990).** In my MSc thesis, I examined the use of natural language processing methods and tools for extracting information from geographical data bases (Supervisor: Dr St. Sommerville).
- **Diploma in Computer Engineering and Informatics, Department of Computer Engineering and Informatics, Engineering School, University of Patras (1984-1989).** In my diploma thesis, I examined the use of dynamic hashing methods in data bases (Supervisor: Prof. I. Pavlidis).



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# WORK EXPERIENCE



### 3. WORK EXPERIENCE

<b>2019 – Today</b>
Director of the Institute of Informatics & Telecommunications, NCSR “Demokritos”
<b>2020 – 2022</b>
Vice President of NCSR “Demokritos” for 2 years (July 2020 – July 2022) In my duties as Vice President, I also served as NCSR Director from May 2021 till July 2021
<b>2021 – Today</b>
Member of the National Committee for Bioethics & Technoethics (the Committee duty is for 4 years, 04/2021 – 04/2025)
<b>2019 – Today</b>
Member of the National Council for Research, Technology and Innovation (the Council duty is for 3 years, 12/2019 – 12/2022)
<b>2007 – Today</b>
Research Director
<b>2004 – 2019</b>
Head of Software & Knowledge Engineering Laboratory (SKEL), Institute of Informatics & Telecommunications, NCSR “Demokritos”
<b>2016 – 2018</b>
Committee Member, Attica Technological Park “Lefkippos”
<b>2010 – 2019</b>
Adjunct Professor, Department of Computer Science & Engineering, University of Texas at Arlington, USA
<b>2008 – 2019</b>
Responsible for Educational Activities, Institute of Informatics & Telecommunications, NCSR “Demokritos”
<b>2008 – 2013</b>
Research Council member, NCSR “Demokritos”
<b>2004 – 2010</b>
Scientific Council member, Institute of Informatics & Telecommunications
<b>2003 – 2007</b>
Senior Researcher
<b>2001 – Today</b>
Organising and lecturing in post-graduate courses
<b>1999 – 2003</b>
Researcher, Institute of Informatics & Telecommunications, NCSR “Demokritos”.
<b>1997 – 1999</b>

Post-doctoral fellow, Institute of Informatics & Telecommunications, NCSR “Demokritos”.
<b>1995 – 1997</b>
Research Associate, Institute of Informatics & Telecommunications, NCSR “Demokritos”.
<b>1995 – 1996</b>
Military Service.
<b>1993 – 1995</b>
Research Assistant, Institute of Informatics & Telecommunications, NCSR “Demokritos”.
<b>1990 – 1993</b>
Worked at the Informatics Institute of the Hellenic Productivity Center on the organization of Informatics seminars, preparation of feasibility studies for the computerization of public sector organizations, scientific management of national and international R&D projects, submission of proposals for funding.
<b>1991 – 1994</b>
Software developer mainly on data base applications. Worked also in an industrial research project on information retrieval from textual bases.
<b>1990 – 1998</b>
Teaching in a large number of Informatics seminars

# 4

## RESEARCH INTERESTS



## 4. RESEARCH INTERESTS

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My research activity mainly resides in the field of Artificial Intelligence (AI) and aims to develop intelligent and user-friendly informational systems for the efficient and intuitive access to information. To this end, I focused on the research and development of methods and techniques in the domains of Natural Language Processing, Data Management and Analysis, Knowledge Representation, and Human-Computer Interaction.

My interest in Natural Language Processing started during my MSc studies, when I focused on the development of natural language interfaces for databases. It continued with my PhD studies, focusing on textual information extraction towards knowledge base enrichment, by exploiting and implementing new methods and techniques for knowledge representation and natural language processing. During the 2 years of my post-doc (1997-99), my research focused on knowledge mining for the faster adaptation of textual information extraction systems in new topics, as well as, for the provision of personalised information based on user data. This research activity continued and extended in the following 4 years (1999-2003) as a Researcher at IIT, focusing on research in textual information extraction and filtering, and natural language processing from knowledge and data bases.

Following my promotion to Senior Researcher in 2003, I overtook the responsibility of leading the Software & Knowledge Engineering Lab (SKEL) at the beginning of 2004. **From 2004 to 2008** I focused on the coordination of SKEL activities through a strategic growth plan. My research activity during that period falls under the two core research directions of the lab: (a) multimedia and multi-source search, extraction, and fusion, and (b) intelligent and personalised Human-Computer Interfaces. Also notable for the period is the effort for exploiting the SKEL lab's research outcomes through patent submissions, the founding of a spin-off company (i-sieve), publishing computational tools as open-source software, and the participation in working groups of standardisation bodies.

In 2007 I became a Research Director, while since 2008 and till 2019 I was responsible for the Institute's educational activities. **During 2008-2013** the Lab continued its dynamic growth, having been established as an important research entity at a national and international level in the research directions defined during the previous period. During these five years (2008-2013), my research was focused on the following domains:

- Information extraction from Web and social network content, for interlinking information extracted from different sources and for argumentation mining
- Multi-document, multilingual text summarisation
- Multimedia content extraction and fusion
- Development of language technologies for Greek
- Big and Heterogeneous data management and analysis
- Dialogue Systems for Human-Computer and Human-Robot Interaction
- Serious Games using information retrieval and extraction techniques
- User Modelling for Personalised Human-Computer Interfaces

**During the last period as SKEL head (2013-2019)**, research and educational activities in SKEL were significantly intensified, as well as the visibility of the Lab at the national and international research community. What should be particularly emphasised is the participation of the Lab in major research actions on Big Data management and analysis. Equally important is the close collaboration with other Labs in NCSR-D, covering different disciplines (health, biology, environment, energy), where Lab technology in data management and analysis is exploited. Regarding my research activity for the period, this was focused on the application of AI and Big Data management and analysis in various fields. Specifically, I focused on the following domains:

- Heterogeneous and Distributed Big Data Management
- Data management and analysis services for e-Infrastructures

- Big Data applications on environment, energy, biology, security
- Information extraction from web content, social networks and databases for multi-source information linking and argument extraction
- Multi-document, multilingual summarisation
- Multimedia information extraction and fusion
- Language technologies and services for Greek
- Human-Robot Interaction and Collaboration
- Sensitive data management
- Natural Language Interfaces
- Serious Games using information retrieval and extraction

Since 2019, and in the context of my duties as IIT Director, I aimed at serving, through my research initiatives, IIT strategic plan to increase the impact of the Institute's scientific outcomes and its revenues from R&D projects. Based on the principles and experiences as SKEL head, my aim was to exploit synergies between IIT Labs and across NCSR-D Institutes, focusing research on specific, promising areas. More specifically:

- IIT participates and co-defines the agenda for the evolution of the European AI landscape via its participation in projects related to the **European AI-on-demand platform (AIoD)**, as it was initiated in the recently completed AI4EU project, augmented via related actions like **AI4Copernicus** (I am the project coordinator) and extended in the context of the recently started **AI4Europe** project which will maintain AIoD platform in the coming years (we lead the core technical workpackage, and I'm a member of the project management board), and the about to start Pre-PAI project, the preparatory action for use of AIoD by European industry (see section 7.1 for additional details).
- IIT coordinates the largest European Digital Innovation Hub (EDIH) of the country, **SmartAttica EDIH**, which focuses on AI and which is about to start (I am the project coordinator). IIT brings in SmartAttica two more NCSR-D Institutes (INRASTES, INN).
- IIT coordinates a pioneering project on culture, the **House of Classical Greek Ideas**, along with the Ministry of Culture (I am the project coordinator), exploiting our expertise on content management and visualisation, HCI, and bringing together a multidisciplinary team of museologists, philosophers, graphic designers, and others.
- IIT provides its expertise on critical strategic initiatives and actions with national impact. Prominent examples are its coordinating role in the formulation and operationalisation of the **Hellenic National Strategy for Artificial Intelligence**, its strong involvement in preparing the **National Plan for Open Science**, and its participation in flagship actions like the **Hellenic Network of Precision Medicine on Cancer**, the **Flagship Action for SARS-CoV-2** (I had the leading role on behalf of NCSR-D on all these initiatives).
- IIT is coordinating or is strongly involved in European initiatives on the use of AI and data science in security and defence through a series of projects on-going or about to start (FaRaDAI, PopAI, FRISCO), in which several labs of IIT and other NCSR-D Institutes are involved.
- IIT is coordinating or is strongly involved in European initiatives on the use of AI and data science in Natural Sciences along with other NCSR-D Labs (Harmonise, ExtremeEarth, Fair4Fusion, ML-Multimem, IS-ENES, DARE). Also, in HPC, HPDA and AI (EuroCC-II and EuroCC).
- IIT has also strongly contributed to the recent initiative for the foundation of the new NCSR-D **Institute of Quantum Computing & Quantum Technology**.

Additional details on the above projects are provided in section 7.

# 5

## COORDINATION OF RESEARCH, INNOVATION AND EDUCATION ACTIVITIES (2004 – TODAY)



## 5. COORDINATION OF RESEARCH, INNOVATION AND EDUCATION ACTIVITIES (2004 – today)

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### 5.1 Research activities

Since the beginning of 2004 and till the end of 2019, I served as the head of the Software & Knowledge Engineering Laboratory - SKEL.

**During the first period (2004-2008)** a growth strategy for the Lab was designed and implemented, based on two core research directions:

- (a) information retrieval, extraction and fusion from multiple media and sources,
- (b) intelligent and personalised Human-Computer Interfaces.

The core of the strategy was the take up of initiatives for the coordination of European and national projects (either as project coordinators or scientific and technical coordinators) in the context of these two research directions. An important parameter for these initiatives was the close collaboration with the other Informatics lab of IIT, the Computational Intelligence Laboratory (CIL), in order to further extend our research activities towards multimedia content processing. These initiatives proved particularly successful, and the Lab took a coordinating or major role in a series of big European and national projects.

The Lab's growth strategy, apart from the continuous and laborious effort to assure funding through EU and national projects, it incorporated actions for solidifying the Lab's potential, ensuring its viability and further strengthening its potential for growth.

The growth strategy for 2004-2008 proved extremely successful, as evidenced by the funded R&D projects, the large number of publications, the educational activities, and the significant increase of SKEL personnel (at the end of 2008, the Lab comprised more than 20 persons).

The initial strategy was enriched in various ways **during the 2008-2013 period** maintaining the basic principle of targeting coordinating roles in European and national projects, while strengthening actions like the following:

- Intensifying research activities especially in the domains of multimedia information extraction and fusion, event recognition in data streams, and heterogeneous and distributed data management.
- Organising the Lab in research groups and creating a hierarchical structure with the uptake of responsibilities for the groups by experienced post-doc Lab researchers. The target was the more efficient coordination and progress of research activities, providing stronger motivation and better exploiting the potential of experienced Lab personnel.
- Restructuring of the financial and administrative management of the Lab's projects to adapt to the needs posed by our participation in a large number of projects, in several of which as coordinators.
- Strengthening and effectively organising educational activities. The PhD scholarship programme was extended to more Universities in USA and Europe.
- Strengthening collaboration within the Institute, within NCSR Demokritos and with external institutions, thus forming a network of regular collaborators in Greece and internationally.
- Further increasing visibility. A critical tool towards this direction was the organisation of important national and international conferences (organisation of the European Conference on Computational Linguistics (EACL-2009) in Athens, organisation of the 6<sup>th</sup> Panhellenic Conference on Artificial Intelligence (SETN-2010)).
- Exploitation of research outcomes. Besides the spin-off i-sieve, which during the period focused on the exploitation of sentiment analysis technologies for brand monitoring, we initiated our efforts for exploiting our research on multi-document and multilingual summarization, as well as,



on document classification and named entity recognition from documents in the Greek language. These efforts yielded results during the following period (2013-2018).

During 2008-2013 the growth of the Lab continued in fast pace, as evidenced by the large number of R&D projects, publications, educational activities and the personnel growth. At the end of the period the Lab comprised about 40 persons, almost doubling its size compared to the previous period.

**During the last period as SKEL head (2013-2019)**, research activities were further increased, as well as the visibility of the Lab at the national and international level. What is most significant for the period is the participation of the Lab in major research actions for Big Data management and analysis, and Artificial Intelligence. Also, the important and strong synergies with other NCSR-D Labs from different scientific disciplines (health, biology, environment, energy), where the data management and analysis expertise of the Lab can be exploited. Furthermore, I should emphasise the development of educational activities with the enhancement of the joint PhD programme (with Rice University and University of Houston entering the programme), the organisation of two MSc programmes, one on Data Science and one on Artificial Intelligence, the organisation of international research-centered summer schools, and the organisation of educational programmes for Primary and Secondary education.

The Lab's strategic plan continued to rely on the uptake of initiatives for coordinating European and national projects, which was proved quite successful during the previous periods. It was, however, even more rewarding during this last period, due to the significant dynamics already established and the solidified positioning of the Lab at the national, European, and international level. Specifically, the adaptations of the growth strategy for the Lab had mainly to do with the following points:

- Strengthening research activity in Big Data management and analysis, in the context of big research projects, in collaboration with other NCSR labs where possible. The multidisciplinary nature of the relevant applications (environment, energy, health, transport, security, e-governance) is something worth noting.
- Expanding the hierarchical structure of the Lab in order to respond more efficiently to the scientific and technical challenges posed by the size and number of our projects. At the end of 2019, the Lab comprised of 6 research groups:
  - ✓ *Content Analysis and Knowledge Technologies (CAKT)*: focuses on natural language analysis, data mining, machine learning, knowledge representation and visualisation, towards developing multimodal analysis methods and tools (e.g. text, image, audio, video).
  - ✓ *Complex Event Recognition (CER)*: focuses on the management and analysis of noisy big data streams. The developed technology is founded on Event Calculus, a formalism based on Logic that supports effective reasoning about complex events.
  - ✓ *Data Engineering Group (DEG)*: studies and analyses database indexing structures and database access requirements for modern analysis methods. Focusing on Big Data uses and applications, it develops smart systems for optimised data access.
  - ✓ *Biomedical and Health Informatics (BioHIT)*: a horizontal Lab activity focusing on the application of knowledge mining and representation techniques, Big Data analytics and machine learning in the Biomedicine and Health sectors, e.g. Precision Medicine.
  - ✓ *RoboSKEL*: it aims to apply Artificial Intelligence technologies in various fields of Robotics, such as Human-Robot Interaction, Human-Robot Collaboration and autonomous path and action planning.
  - ✓ *Personalisation & Social Network Analysis (PerSoNA)*: it deals with information personalisation methods and data mining for user modelling, towards studying user trust and influence.
- Strengthening the project administration office of the Lab.
- Enhancing the technical support for the Lab's computational infrastructure, which was significantly expanded due to the involvement in Big Data management and analysis research.

- Promoting and disseminating research outcomes
- Expanding educational activities:
  - ✓ Expansion of the PhD scholarship programme in collaboration with US universities.
  - ✓ Organising and running an MSc programme in Data Science.
  - ✓ Organisation of international research-centred summer schools
  - ✓ Systematic design and organisation of educational programmes targeting primary and secondary education. Since September 2015, over 5,000 students have attended.
  - ✓ Initiation of competence programmes targeting business, in collaboration with market stakeholders. Organisation of entrepreneurship seminars.
- Solidifying the collaborations within the Institute and the Centre. At the Institute level, we continued our synergies with the Computational Intelligence Laboratory (CIL) and initiated new ones with the Integrated Systems Laboratory (ISL). At the NCSR level, we enforced our collaboration with Labs at the Institutes of Nanotechnology, Biology and INRASTES.
- Exploitation of research outcomes, namely the outcomes on multi-document and multilingual summarisation, and document classification and named entity extraction over texts in Greek (collaborations with EY, IBM Hellas, SciFY, ATC).

At the end of 2019, the Lab was at its most dynamic and productive position since its setup, having undertaken the coordination of major European projects, establishing synergies with Labs of other Institutes and Research Centres, actively participating in national infrastructure projects, and promoting important educational initiatives in Greece and abroad.

Since the beginning of 2020, SKEL is led by George Paliouras being constantly growing, and aiming to further strengthen its international role in the field of AI. It is currently one of the largest AI Labs in the country, with more than 60 researchers.

## **5.2 Education Activities**

My intense participation in MSc and competence programmes since the beginning of my career, led to the uptake and promotion of relevant activities, initially as head of SKEL and later as the Institute's responsible for educational issues, until today as IIT Director.

The training of new researchers via PhD and MSc programmes was and continues to be one of the core aspects of SKEL's strategic growth plan, acting as the moving force for extending the Lab's research activities.

### **PhD Programmes**

Until 2010, NCSR-D maintained a large PhD scholarship programme. When this was terminated (counting about 120 PhD students at that moment) because of the financial crisis, we designed and implemented an ambitious PhD scholarship programme, collaborating with international universities. The programme was based on existing synergies with Greek Professors in US and European Universities.

As the responsible for the educational issues of the Institute from 2008 till 2019, I took the initiative for coordinating the programme, starting with two universities, University of Texas at Arlington (UTA) in Computer Science and University of Loughborough (UL) in Telecommunications. Each University co-signed a Memorandum of Collaboration and an agreement for a Joint PhD Programme. These documents formed the basis for the future partnerships and the programmes that followed. The remarkably successful start of the programme led to the expansion of the collaboration network with more Universities, mainly in the US. It's worth to note the collaboration in this programme with Rice

University, one of the top-ranked US Universities. Until today, 11 students have completed their PhD, 3 in Telecommunications and 8 in AI. It should be noted that the collaboration with universities abroad is not limited to the joint PhD programmes, but is also extended to joint research and educational activities, new projects co-funded by the US and the EU, joint summer schools and seminars, etc. This was our intension from the beginning, that is, to create a network with prestigious Institutions to help us establish and strengthen further our research activities.

Apart from the international PhD programme, SKEL has also active participation in the industrial scholarship programme of NCSR with the Stavros Niarchos Foundation (SNF) and various collaborating companies, started in mid-2017. This innovative initiative supports 4-year PhD scholarships (3 funded by SNF and 1 by the collaborating companies).

We also recently initiated the Qualco fellowships programme (Qualco is a fintech company). This is a 5-years Fellowship programme which supports young researchers to delve into their research in the fintech field using AI and Big Data. The programme provides fellowships for PhDs and Post-docs hosted at IIT, awards relevant MSc and BSc theses and internships, and also supports hackathons in the field.

Furthermore, we support PhD candidates in collaboration with Greek universities, who work on research projects. For covering the needs of these students as well as for students that prepare their MSc or BSc theses and interns, we organise seminars where students, researchers and external collaborators present their work.

### ***MSc Programmes***

Several SKEL lab researchers have been very active as lecturers in MSc courses for some years (cf. section 8 regarding my own participation).

During recent years, the Institute participates in 3 cross-institutional MSc programmes with Greek universities. SKEL participates in two of them, for which I am responsible:

[MSc in Data Science](#): Started in 2017, as the result of collaboration between the University of the Peloponnese and IIT. A 4-semester programme initially. Currently, a 3-semester programme is provided. It must be noted that most of its more than 100 students trained so far are coming from the industry aiming at improving their skills in big data management and mining, machine learning and applied data science.

[MSc in Artificial Intelligence](#): This is the result of a collaboration between the Department of Digital Systems of the School of Information and Communication Technologies, of the University of Piraeus and IIT. The MSc operates since 2019, involving mostly graduates of Computer Science / Engineering Depts. It provides a 3-semester programme with courses in knowledge representation and reasoning, machine learning, natural language processing and others.

I was also actively involved in the setup of the new joint [MSc in Quantum Computing & Quantum Technologies](#) (starting in 2022). This is a collaboration between the Institute of Nanoscience and Nanotechnology (INN), with IIT participation, and the Democritus University of Thrace. It aims to introduce students to cutting-edge applications and research in the area of quantum computing and quantum technologies.

### ***Graduate & Post-graduate Theses / Internships***

As head of SKEL Lab and responsible for IIT's educational activities, I sought to better organise the application submission and monitoring process for (post-) graduate theses and internships. To this end, we dedicate a section of the Institute's website for announcing and updating proposed topics,

facilitating our communication with interested students. The number of students enrolling for (post-) graduate exercises and internships has significantly increased in the recent years.

There are multiple benefits from our participation in theses and exercises, regarding the recruitment of research personnel and the collaboration with universities. Thus, we will try to extend our participation as an Institute in such activities during the next years.

### ***Summer Schools***

In the context of our joint PhD programme with the University of Texas at Arlington (UTA), and in collaboration with the University of the Aegean, we organised for three consecutive years (2011-2013) a study abroad program for graduate and post-graduate UTA students.

Furthermore, we organized for 2 consecutive years (2013-2014) an innovative International Research-centred Summer School in Cognitive Systems and Interactive Robotics. For approximately a month, about 30 students were organized in research groups, up taking the implementation of a research project relevant to the Lab's research activities, under the supervision of researchers from SKEL and collaborating institutions. Simultaneously, they attended daily lectures from Greek and foreign scientists, participated in hackathons, presented their assigned projects and – ultimately – competed for the best project prize. Many of the projects were subsequently presented in publications in international scientific conferences. The summer school formed the basis for new SKEL collaborations as well as for the recruitment of new researchers.

During the last years, I was involved in the organisation of the following summer schools at NCSR-D:

- [AthNLP2019](#): The 1<sup>st</sup> Athens Natural Language Processing Summer School took place from 18 to 25 September 2019 on the campus of NCSR-D. The school which gathered more than 100 University students, was organised jointly by SKEL | The AI Lab of NCSR Demokritos, the Athens University of Economics and Business, Research Center Athena and the Heriot-Watt University.
- [IS-ENES3 Summer School on Data Science for Climate Modelling](#): The IS-ENES3 Summer School took place from 1 to 7 September 2022 at NCSR-D. The Summer School is organised by the [IS-ENES3 consortium](#) and aims to increase expertise and skills on theoretical and practical concepts of Data Science, building upon and mainly targeting how to accelerate scientific discovery from data.

### ***Educational Programmes for Schools***

The need to systematically and effectively promote Demokritos' activities in society and particularly to primary and secondary education students was something that preoccupied me since the first years of my service as the Institute's responsible for education. Even though there were sporadic actions towards this direction (open gate days, school visits), they weren't systematic and under a concrete pedagogical framework.

Our collaboration – mainly through cultural research projects – with institutions like the Foundation of the Hellenic World, led me to the decision to design and implement in SKEL a new educational program, initially for late Primary and early Secondary education students, in collaboration with a professional museo-pedagogist.

The first educational program dealt with Human-Robot Interaction and was designed by the museopedagogist in collaboration with RoboSKEL, SKEL's robotics group. It started at the autumn of 2015 and was later enriched with a Brain-Computer Interface program. For the following year, we designed another educational program on databases for Secondary education students. The two programs spanned three days per week, from October until May, and met exceptional success. During

the first two years (2015-2017) more than 3,000 students attended. The reviews from students and teachers were excellent.

Since the summer of 2017, and now with central support from Demokritos, the educational programs were extended to cover more of Demokritos' activities. The programs now cover all 5 working days throughout the school year, with almost 5000 students attending these programs every year..

The programme's benefits are substantial for the Centre. Students coming from Attica mainly but also the periphery are informed in a pedagogically sound manner for our research activities, thus constituting the best means of promoting our work to society. In parallel, they are acquainted with research practices and disciplines, a fact that for some will be crucial on their future choices and paths.

The success of the programme has created a great dynamic and enthusiasm to the participants. The challenge for the forthcoming years is to sustain and extend these, by incorporating new actions through even more NCSR Institutes.

### **5.3 Innovation activities**

The effort to exploit research outcomes of SKEL started in 2003, when we produced a novel and effective methodology for web page classification. The method exploited machine learning, natural language analysis and image analysis, and presented significant commercial potential, as it allowed automatic page filtering. Thus, in 2004, we founded i-sieve technologies spin-off ([www.isieve.com](http://www.isieve.com)), initially focused on content analysis and web page classification services. During the following years, the initial technology was enriched with information extraction methods and was applied to opinion mining from web pages, blogs, chats and other documents. It should be noted that the IPR for our technology was established via a patent by the Industrial Property Organization (Method for probabilistic information fusion to filter multi-lingual, semi-structured and multimedia electronic content). I-sieve was hosted at the Lefkippos Technology Park of NCSR till 2020, providing brand monitoring services to international companies and corporations.

Founding i-sieve was the first step on the effort of exploiting Lab's research outcomes. During the last years, this effort intensified through various activities:

- A Lab for the provision of Informatics Services was founded, aiming to exploit research outcomes of the Informatics sector. The activities of this Lab along with the other Services Labs of IIT are currently performed through our Digital Innovation Hub "Attica Hub for the Economy of Data and Devices" ([ahedd DIH](#)). I set up the ahedd DIH at the beginning of 2019, aiming to create an ecosystem of research & corporate entities that have know-how in offering digital transformation & innovation solutions using Artificial Intelligence, Big Data and Internet of Things technologies as horizontal enablers.
- In 2013, we signed an agreement with the non-profit organisation SciFY for exploiting NewSum technology for multi-document, multi-source and multilingual document summarisation. NewSum technology is constantly enriched with new methods, while new services and products are being developed.
- In 2015, we signed a collaboration agreement with IBM Hellas, uptaking document analysis for the Greek language (classification, named entity recognition, opinion mining), a service that was integrated with IBM services. I had the technical management of the relevant internal project.
- We received funding from the Google Digital News Initiative (DNI), through a competitive process, for 2 projects for research exploitation, for which I was responsible:
  - StoryBot provided an integrated platform for automated news production and presentation (publications). StoryBot incorporates tools for parallel data crawling from multiple feeds (e.g.

RSS, social media APIs), content aggregation (including content clustering, categorization and summarization) and personalization features.

- OpenJournalism (OpJ) aimed to strengthen the re-usability of open data by journalists through the following toolkit: (a) Company name matching and advanced search in public procurement, (b) 1-click provenance to original data source and (c) News enrichment through data tags.
- Two start-ups were created during the period by SKEL researchers: Langaware that predicts neurodegenerative diseases by detecting and monitoring digital biomarkers based on language and speech; Linked Business which provides analytical and decision-making tools for Greek companies, across various market segments, to discover and understand market trends, potential customers and competition.
- IIT offers innovative AI training programs addressed to businesses through ahedd DIH and SciFY. [Leading AI-empowered Innovation](#) that familiarise top-level executives with AI potentials and risks and build an AI roadmap by defining the first quick-win and value-generating pilots. [AI Foundations workshop](#) that intends to provide a quick familiarisation with Artificial Intelligence concepts and applications and use cases. [Transforming your Business with AI](#), a personalised hands-on workshop. [1000 Pioneers for AI In Greece](#): This newly created initiative of SciFY and ahedd DIH aims to train 1000 Pioneers in AI who will act as advocates of AI in Greece.
- A notable R&D collaboration since 2019 has been the collaboration of SKEL with EY Global in AI, in the specialised field of document intelligence. Under this collaboration, the DICE- Centre of Excellence in Document Intelligence has been created. Within DICE, IIT Researchers and Research Associates conduct research for new technological solutions in the field of document intelligence, which will be adopted and/or commercialised by EY Global. The outcome of research work in DICE is patents and scientific publications.

6

# IIT DIRECTOR (01/2019 – TODAY)



## 6. IIT Director (01/2019 – today)

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Right after my election (November 2018), and even before taking over formally the Director's position (end of January 2019), I started setting in motion the strategic plan which I had presented to the election board. This plan is based on the parallel and synergetic growth of three pillars (Research, Innovation, and Education) and the establishment of the corresponding support mechanisms for these pillars. It exploits the principles and experiences from leading SKEL and coordinating various research, innovation, and education activities. During the almost 4 years of my duty as IIT Director, the implementation of the strategic plan was quite successful.

As it concerns the Research pillar, the Institute met significant success in attracting funding from diverse sources, with EU projects remaining the major one, but with national and industrial projects contributing substantially to the overall revenue. What is also important is the fulfilment of the goal to coordinate or have a leading role in these projects, as the best means to ensure that effort is focused on the core scientific agendas and aligned with the identity of the Institute.

Moreover, the period is characterised by the strengthening of the intra-Institute collaborations and the gradual shaping of a common research space, expected to expand further in the future, as solutions combining AI and Advanced Telecommunication Networks gain continuously growing interest. Synergies with other NCSR-D Institutes were also strengthened through several research projects and initiatives, in the domains of health, materials, energy and environment, where the exploitation of AI and big data analytics is growing. It must be noted that we have reached a point where IIT researchers and researchers of other Institutes are able to share objectives and vision, building upon their needs and expertise. This process started before the reporting period and significantly expanded during the last years.

Furthermore, IIT contributed its expertise to strategic initiatives and actions with national and European impact, along with Greek and European organisations. The coordinating role of IIT in the Hellenic National Strategy for AI, its participation in national and European flagship actions, its role in the European AI on demand platform, the setup of the House of Classical Greek Ideas, are among these initiatives.

The Education pillar continued to develop through the joint PhD programmes with foreign Universities, the setup of industrial fellowships, the organisation of summer schools and seminars as well as the expansion of joint MSc programmes with Greek Universities.

Innovation was the area that met the most drastic changes, due to – on the one hand – the increased focus of the Institute on the pillar and – on the other hand – the significant developments in the management of innovation-centred research at the European level and the changes in the financial and business status of the country. IIT made the most of the new opportunities stemming from the emergence of Digital Innovation Hubs as a major catalyst for connecting research and industry, and the increased demand from start-ups and emerging enterprises for advanced technologies. IIT has been a pioneer within NCSR-D and probably in the whole Greek innovation ecosystem, in promoting, creating, and commercializing innovation, particularly through collaborations with enterprises for further research, specialized consulting services and exploitation of IIT know-how in product development.

At the operational level, the Institute reorganised effectively its structure and put in place the support mechanisms required for ensuring its growth in all strategic pillars. IIT comes out of the period with a stronger and better-organised administrative setup and a dedicated communications team ensuring that its activities and achievements get visibility and strengthen their impact. Furthermore, the organisation of strong IT operations, including the setup and management of the NCSR-D eGovernance office, the re-organisation of the Network Operation Center and the renovation of our network and computational infrastructure, ensure that the Institute is equipped to handle the increased demand set by its central role within NCSR-D as the entity responsible for serving the



connectivity, data management and compute requirements across disciplines. Furthermore, with respect to the building infrastructures, IIT office spaces were expanded and renovated to cover our increasing needs until the construction of our new smart building which is scheduled at the end of 2024. Our aim is to exploit the features of the new building in our research initiatives in AI and IoT.

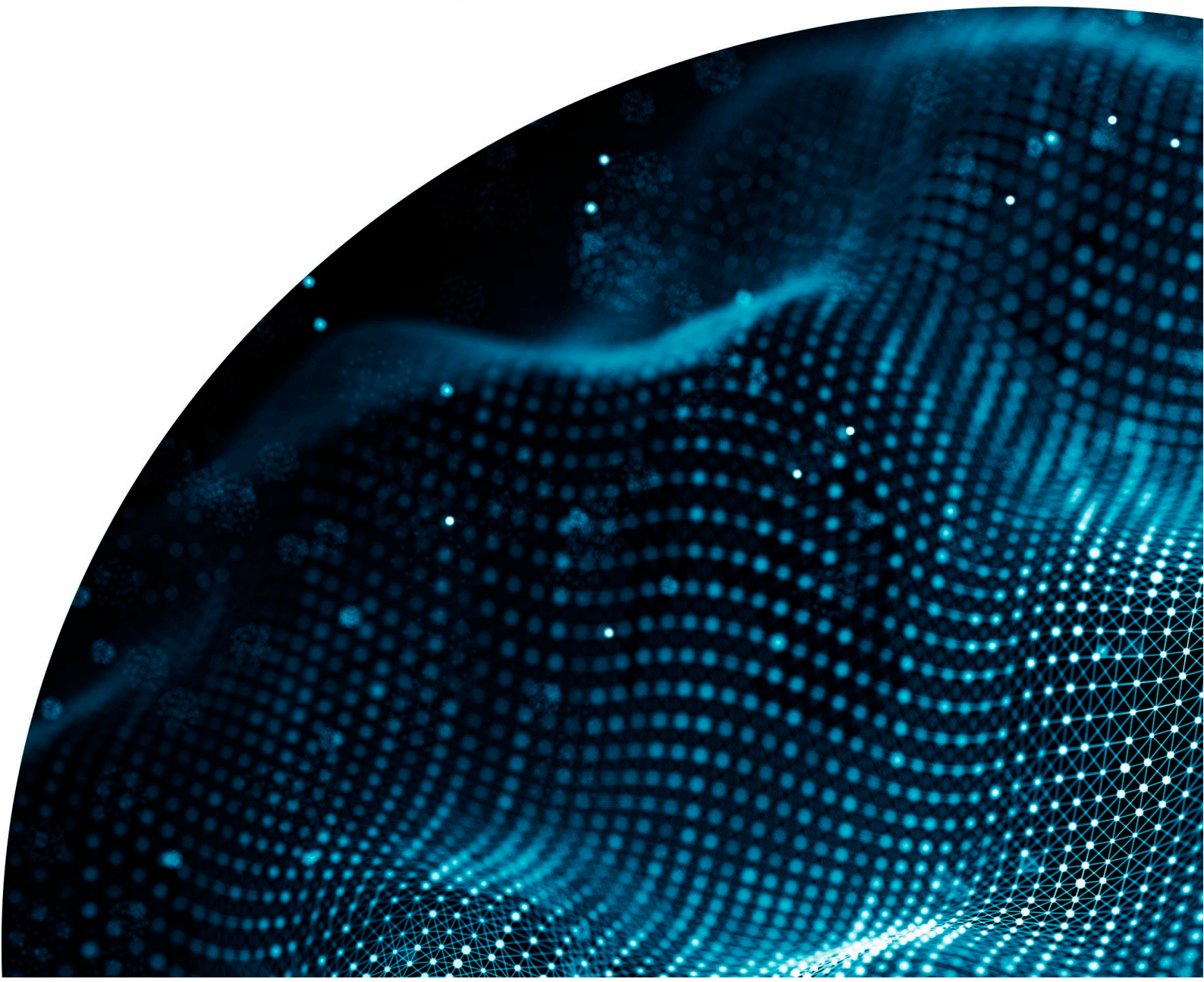
It is worth mentioning, that during the last 4 years, the scientific areas where IIT historically excels and focuses on, met seismic changes, radical developments and constant presence in the business world and the public eye. The society and the economy are even more dependent on data, are relying on fast and robust connectivity using advanced network technologies, and integrate AI in its many facets, from day-to-day activities to high-level decision support. The situation, while naturally offering a multitude of opportunities, also leverages the responsibilities of the Institute to lead scientific developments in these areas while also considering and tackling the ethical, legal, and social implications of the technology. IIT is already in the vanguard of the ethical AI movement as prioritised by the EU, having important scientific and policy results on the subject. The Institute actively puts effort in the democratisation of AI, via the provision of affordable high-tech solutions to smaller companies and individuals, the organisation of seminars on AI and its usage and its central role in flagship European and national actions that shape the future of AI in the Union and the world.

It must also be noted that during my duty as IIT Director, I served as Vice President of NCSR “Demokritos” for 2 years (July 2020 – July 2022). In my duties as Vice President, I also served as NCSR Director from May 2021 till July 2021.

Since December 2019, I am a member of the National Council of Research, Technology and Innovation (ESETEK). Also, since April 2021, I am a member of the National Committee for Bioethics & Technoethics.

# 7

## COORDINATION, PARTICIPATION IN R&D PROJECTS



## 7. COORDINATION, PARTICIPATION IN R&D PROJECTS

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This section summarises the R&D projects which I coordinated or participated.

As it concerns the ongoing projects, the listed projects are the ones in which I had a coordinating role (project, scientific/technical coordinator, scientific lead for NCSR-D).

More information for each of these projects can be found at the Institute site<sup>1</sup>.

### 7.1 Ongoing Projects

#### *EU Projects*

The listed projects are organised in the following categories:

- Projects related to the European AI-on-demand platform (AIoD): AI4Copernicus, AI4Europe, Pre-PAI
- Projects in the ecosystem of European Digital Innovation Hubs (EDIHs): SmartAttica, DIH-World, i4Trust, EUHubs4Data, DIH4CPS
- Competence centres in the framework of EuroHPC programme: EuroCC, EuroCC2
- Defence, Security: FaRaDAI, FRISCO
- Research infrastructures: IS-ENES3
- Marie-Curie: ML-Multimem

**The budget for NCSR-D for all these EU on-going projects, I am responsible for, is more than 6,500,000€.**

#### **AI4Copernicus: Reinforcing the AI4EU Platform by Advancing Earth Observation Intelligence, Innovation and Adoption**

AI4Copernicus aims to make the AI-on-demand platform (AIoD) the platform of choice for users of Copernicus data along the value chain (scientists, SMEs, non-tech sector). AI4Copernicus will achieve this by exposing AIoD resources on DIAS (data and information access services) platforms, making it easy to procure computing power and large EO data, as well as to access training material and expertise. AI4Copernicus proposes to reinforce and optimise the AIoD platform service offering with AI4Copernicus datasets, tools and services relevant to Copernicus data to facilitate the use and uptake of the platform resources in domains of high economic and societal impact, such as in Agriculture, Energy and Security. A series of 4 open calls have been planned, leading to 8 small-scale experiments (smaller, single-beneficiary experimental projects targeting technology-advanced users) and 9 use-cases (larger-budget projects, involving at least one non-technology user). The open calls will necessitate the utilisation of DIAS platforms, Copernicus data, the AIoD platform and the services and resources that will be provided by the AI4Copernicus project. Through organising, facilitating and mentoring these Open Calls, AI4Copernicus will reach out to new user domains and boost the use of the AIoD platform.

#### *Project Coordinator*

Programme: H2020

Start Date: 01/01/2021 Duration: 36 months

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<sup>1</sup> <https://www.iit.demokritos.gr/research/projects/>

NCSR-D Budget: 2,703,125 €

### **AI4EUROPE: An AI On-Demand Platform to support Research Excellence in Europe**

Europe is implementing an AI strategy that seeks to create a research environment characterised by scientific excellence and consistent with the fundamental ethical values of its citizens. Part of this strategy foresees the consolidation of ongoing research activities through the creation and maintenance of an AI on-demand Platform that will act as a community resource for the research community, facilitating experimentation, knowledge sharing and the development of state-of-the-art solutions and technologies. AI4Europe builds on the work of AI4EU and multiple supporting projects (ICT-48/ICT-49), creating an open, impartial, and collaborative Platform, built by the European research community according to their needs.

Scientific Lead for NCSR-D, member of the project management board

Programme: Horizon Europe

Start Date: 01/07/2022 Duration: 42 months

NCSR-D Budget: 547,500 €

### **Pre-PAI: Preparation of the development of the AI-on-demand platform**

Pre-PAI will be the realization of “Preparatory actions for the AI-on-demand platform” providing the blueprint for the further development, deployment, and operation of the European AI-on-demand platform. The project will carry out a comprehensive requirement analysis for different stakeholder groups, mainly SMEs, industrial sectors, and public administration. These requirements analyses will lead to an overall roadmap and plan to build and consolidate the AI-on-demand platform. It includes a comprehensive concept to provide trustworthy AI assets into the platform to support European leadership on trustworthy AI and to offer AI “Made in Europe”.

Scientific Lead for NCSR-D

Programme: DIGITAL-CSA

Start Date: 01/12/2022 Duration: 9 months

NCSR-D Budget: 13,375 €

### **SmartAttica-AtHeNAI: Smart Attica DIH, the Attica region - Greek Innovation hub for Artificial Intelligence in Energy and Environment, Supply chain and mobility, Culture and Tourism**

SmartAttica aims to constitute the reference AI EDIH of Greece and increase the digital maturity of Greek businesses and local authorities through increased AI uptake. Its thematic focus lies upon 3 financial activity sectors which are critical for the targeted Attica region and the Greek economy. These sectors, Energy and Environment, Supply chain and mobility, as well as Culture and Tourism, are also aligned to established international and national actions for green, sustainable, inclusive digital growth. The Hub is based on existing clusters and EU-wide initiatives, making it a valuable policy-support instrument towards key EU directions. SmartAttica mobilises powerful infrastructures and facilities, from 5G to HPC to the entire NCSR smart campus, where solutions of all sectors can be deployed, tested and analysed. SmartAttica services (test-before-invest, upskilling, networking and investment support) will seamlessly integrate with EEN and local business networks. They will also

build upon the world-level Hub's expertise on AI, supported by the HPC & Cybersecurity consortium knowhow, but also horizontally integrate the human-centric, ethics-by-design EU AI vision, and infuse resilience and sustainability considerations across service provision. SmartAttica will mobilize an inclusive, collaborative innovation ecosystem bootstrapped through its unique arsenal of 17 partners, which constitute major stakeholders in Greece & EU in AI and bring significant additional knowhow in domains such as HPC, Cybersecurity, advanced digital skills, and domain knowledge across all thematic focus areas. This expertise and the varying roles of the partners guarantees the empowerment of the beneficiaries, offering a full range of services coming from research and academia, private sector entrepreneurship, banking and technology transfer, accelerators, public sector and local society representatives, social change catalyst, national infrastructures.

#### Project Coordinator

Programme: DIGITAL-SIMPLE

Start Date: 01/11/2022 Duration: 36 months

NCSR-D Budget: 1,330,432.65 €

#### **DIH-World**

DIH-World aims to harmonise and widen the landscape of European DIHs across all of Europe to address the "digital innovation hubs divide". DIH-World aims to accelerate the uptake of advanced digital technologies by European manufacturing SMEs in all sectors by supporting them in building sustainable competitive advantages and reaching global markets.

#### Scientific Lead for NCSR-D

Programme: H2020

Start Date: 01/03/2022 Duration: 21 months

NCSR-D Budget: 28,500 €

#### **i4trust: Data Spaces for effective and trusted data sharing**

i4Trust aims to support different players in the creation of Data Spaces by relying on common standard-based mechanisms for data interoperability, data value creation, as well as data sovereignty and trust. SMEs and DIHs – spanning across a wider variety of regions and sectors in Europe – have been invited to contribute with innovative experiments toward supporting a sustainable Data Economy.

#### Scientific Lead for NCSR-D

Programme: H2020

Start Date: 24/01/2022 Duration: 10 months

NCSR-D Budget: 7,500 €

#### **EUHubs4Data: European Federation of Data driven Hubs**

Most of Europe's SMEs lag behind in data-driven innovation. To tackle this problem, EUHubs4Data project will build a European federation of Data Innovation Hubs based on existing key players in this area and connecting with data incubators and platforms, SME networks, AI communities, skills and training organisations and open data repositories.

Scientific Lead for NCSR-D

Programme: H2020

Start Date: 01/10/2021 Duration: 26 months

NCSR-D Budget: 52,200 €

**DIH4CPS: DIHs for Embedding Interoperability in Cyber-Physical Systems of European SMEs**

This initiative for Fostering DIHs will help European enterprises overcome the innovation hurdles and establish Europe as a world leading innovator of the Fourth Industrial Revolution. DIH4CPS will create an embracing, interdisciplinary network of DIHs and solution providers, focused on cyber-physical and embedded systems, interweaving knowledge and technologies from different domains, and connecting regional clusters with the pan-European expert pool of DIHs.

Scientific Lead for NCSR-D

Programme: H2020 Project (<https://dih4cps.eu/> )

Start Date: 01/09/2021 Duration: 20 months

NCSR-D Budget: 20,000 €

**EuroCC 2: National Competence Centres in the framework of EuroHPC Phase 2**

The mission of EuroCC 2 is to continue the establishment of a network of National Centres of Competence (NCC) in the most efficient way (it follows up the initial EuroCC project), while continuing to address the differences in the maturity of HPC deployment in Europe, for which improvement has already been noted. Therefore, in addition to high-level management to monitor progress in the NCCs' development, the main task of the overall activity is to support national centres in setting up their individual operational frameworks, while accessing and making the most of the experience and expertise currently available at national and European level.

Scientific Lead for NCSR-D

Programme: DIGITAL-JU-SIMPLE

Start Date: 01/01/2023 Duration: 36 months

NCSR-D Budget: 389,266 €

**EuroCC: National Competence Centres in the framework of EuroHPC**

The EuroCC project aims to implement the European network of National Competence Centres (NCC) in the area of high-performance computing (HPC), by establishing in each of the participating nations (33 member and associated countries), a HPC Competence Centre as a reference and single contact point for academia, industry, public administrations and the general public. The project aims to elevate the participating countries to a common high level in the fields of HPC, HPDA (high-

performance data analytics) and artificial intelligence (AI). NCSR Demokritos is a member of EuroCC and participates in the Greek National Competence Center (NCC).

Scientific Lead for NCSR-D

Programme: H2020

Start Date: 01/09/2020 Duration: 32 months

NCSR-D Budget: 350,000 €

**FaRADAI: Frugal and Robust AI for Defence Advanced Intelligence**

An important crosscutting need for Artificial Intelligence is to create technologies for trustworthy autonomous and frugal learning, i.e., the ability of a system to adapt and learn from its environment, including from user supervision, for a reasonable cost and without intervention from expert developers nor regression. Such technologies can be highly disruptive and have high impacts for many capabilities, especially when the information to manage is highly variable or unpredictable and high adaptability is needed. Within the FaRADAI project, current advances in AI technologies will be thoroughly researched in parallel with a detailed study of the main challenges imposed by a defence system. Aiming at significant breakthroughs in AI, the models will accelerate their wider application and deployment in defence systems increasing their impact and the overall performance.

Scientific Lead for NCSR-D

Programme: European Defence Fund Action

Start Date: 1/12/2022 Duration: 42 months

NCSR-D Budget: 600,000 €

**FRISCO: Fighting teRrorISt Content Online**

Terrorist content and other illegal content online are an increasing issue both from a security and public policy perspective. As a response, the Terrorist Content Online (TCO) Regulation is addressing violent extremism and the dissemination of TCO, setting out specific measures that hosting service providers (HSPs) exposed to TCO must implement. However, these measures might represent an important burden for HSPs and especially for micro and small HSPs, which are the target group of this call and this project "Fighting Terrorist Content Online" - FRISCO. The general objective of FRISCO is to support HSPs to comply to the TCO regulation, through (a) Informing and increasing HSPs' awareness of the TCO Regulation and their new obligations; (b) Developing and validating tools, frameworks and mechanisms to support HSPs in the implementation of the TCO regulation; (c) Sharing experience, best practices and tools to support the implementation of the TCO regulation.

Project Coordinator

Programme: ISF-PJG (Internal Security Fund)

Start Date: 01/10/2022 Duration: 24 months

NCSR-D Budget: 309,337 €

**IS-ENES3: Infrastructure for the European Network for Earth System modelling - Phase 3**

IS-ENES3 will deliver the third phase of the distributed e-infrastructure of the European Network for Earth System Modelling (ENES). IS-ENES3 will stimulate collaboration, disseminate software and data, and further integrate the European climate science community. It will deliver the European part of the Earth System Grid Federation and a central point of entry to services providing access to new data, software, models and tools.

Scientific Lead for NCSR-D

Programme: H2020

Start Date: 01/01/2019 Duration: 39 months

NCSR-D Budget: 107,500 €

**ML-MULTIMEM: Machine Learning-aided Multiscale Modelling Framework for Polymer Membranes**

The goal of this project is to build a systematic modelling framework for advanced polymer materials,. Polymers are very challenging to simulate, due to the wide range of timescales that are present in these systems and require elaborate system-specific multiscale strategies. A hierarchical simulation strategy will be developed, encompassing atomistic, mesoscopic and continuum scales, integrating machine learning techniques. The artificial intelligence aided multi-scale approach proposed constitutes a generalized methodology for the efficient computational study of polymers. The synergy of unsupervised machine learning (ML) clustering techniques and neural networks (NN), will enable the extraction of accurate coarse-grained (CG) representations and force fields of the polymer systems, bringing this complex problem within computational reach. The project is a synergy between SKEL The AI lab and the Institute of Nanoscience and Nanotechnology (INN).

Project Coordinator

Programme: Marie Skłodowska-Curie Actions

Start Date: 15/11/2021 Duration: 24 months

NCSR-D Budget: 153,085 €

*National Projects*

The listed national projects are organised in the following categories:

- Culture: House of Classical Greek Ideas, Smart Subs
- Health: SARS-CoV-2
- Research Infrastructures: EN.I.R.I.S.S.T
- Fellowships: Qualco

**The NCSR-D budget for these on-going national projects, I am responsible for, is more than 2,400,000 €.**

**House of Classical Greek Ideas**

The aim of the project is to create the House of Classical Greek Ideas, a model exhibition on Greek ideas and ancient Greek philosophy -the greatest cultural achievement of ancient Greeks and a worldwide cultural legacy. The exhibition will be housed in the building of the Athens Conservatoire



and can be combined with a visit to the adjacent archaeological site of Aristotle's Lyceum. The development of the interactive exhibits will employ an innovative method of 'ideas representation' with the aim of presenting them in an attractive and accessible way for the general public. The project will utilize cutting-edge technologies such as interactive digital walls, augmented reality applications and applications that use artificial intelligence as part of the interaction with the visitor. The exhibition will target different types of visitors such as tourists and school students. NCSR D has undertaken Subproject 1 "Illustration of Classical Greek Ideas" which includes: the development and evaluation of the "ideas illustration" methodology, the collection and classification of material based on specially formulated ontology, the creation of an extensible content management system, the implementation and evaluation of pilot exhibitions, the dissemination and exploitation of project results.

Coordinator of NCSR-D sub-projects

Programme: National Project (<https://www.houseofclassicalgreekideas.com/>)

Start Date: 01/09/2019 Duration: 44 months

NCSR-D Budget: 1,401,431 €

**Smart Subs: Subtitling app for watching live performances**

The aim of the project is to develop and improve the existing know-how / technology and applications of language recognition and sentence tagging as well as to develop and promote research to synchronize live oral performances (sound) and written subtitles to develop an application for "smart wearable glasses", 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. Cultural content will also be made accessible to foreign-language audiences through subtitles in different languages at the same time, thus contributing to the promotion of the cultural heritage and the further development of the touristic product. The application can be used with the same technical requirements in different locations (outdoor and indoor theatres, dome theatres etc).

Scientific Lead for NCSR-D

Programme: National Project (<http://smartsubs.ime.gr/gr/index.html>)

Start Date: 30/09/2021 Duration: 26 months

NCSR-D Budget: 261,945 €

**SARS-CoV-2: Flagship Action for SARS-CoV-2. Epidemiological study in Greece**

The Flagship Action for SARS-CoV-2 will carry out an epidemiological study in Greece through extensive virus and antibody detection campaigns, viral genome sequencing, and patients' genome sequencing. NCSR "Demokritos" and ATHENA Research Centre collaborate on the sub-project that develops the computational infrastructure needed to: (a) store and process sequencing data, supporting the efficient execution of bioinformatics workflows designed and implemented in other sub-projects, and (b) integrate and correlate this data with patients' demographic and clinical data. This infrastructure will serve the needs of the scientific community to analyse large-scale genomic and clinical data of Greek patients and study their correlation with the risk of the disease, drug efficacy,

and other factors. The infrastructure will be designed based on provisioning and containerization technologies that enable seamless installation and scalable execution in modern computing infrastructures (Kubernetes, Docker, distributed file system). The sub-project will also deal with issues of data collection, disposal and organization in a way that data protection and GDPR compliance are enforced without compromising data service quality.

Scientific Lead for NCSR-D

Programme: National Project (<https://greecevs корона.gr/> )

Start Date: 01/05/2020 Duration: 36 months

NCSR-D Budget: 160,000 €

**EN.I.R.I.S.S.T.: Intelligent Research Infrastructure for Shipping, Supply chain, Transport and Logistics**

EN.I.R.I.S.S.T. is a unique and pioneering Research Infrastructure that aims to fill a significant existing research gap in the fields of Shipping, Supply Chain and Transport in Greece. It combines the collection and processing of data (with the aim of protecting privacy and copyright), the development of innovative models and programming techniques, the development of useful applications, secure and user-friendly, and finally the development of digital observatories aimed at support for public and private stakeholders (businesses, public bodies, research organizations, etc.). In this way, the vision of EN.I.R.I.S.S.T. is to become a centre of excellence that will promote and support research in its scientific fields. The objectives of EN.I.R.I.S.S.T. are:

- Develop an intelligent research and business platform to support key economic activities and small and medium-sized enterprises active in the areas of research infrastructure interest.
- Collect, process and provide researchers and users with information & tools on national & international passenger & freight transport including sea, air, inland and intermodal transport.
- Support stakeholders in original research, investment plans and policies (academic community, researchers, infrastructure operators, private & public companies, policy makers)
- To create a multi-dimensional institution of economic & research development for Greece, by creating new & enhancing existing networks that will ensure the flow of knowledge & information

Scientific Lead for NCSR-D

Programme: National Project (<https://www.enirisst.gr/> )

Start Date: 01/04/2019 Duration: 47 months

NCSR-D Budget: 98,625 €

**Qualco Fellowship programme**

NCSR Demokritos and Qualco, a leader in providing technology solutions and services that cover the full range of loan and credit management lifecycle, are pleased to announce their collaboration for the promotion of innovation, utilising Artificial Intelligence and Big Data management technologies to meet business challenges in the field of financial technology (Fintech). NCSR Demokritos & Qualco launch the NCSR D – Qualco Fellowship programme which supports young researchers to delve into

their research in the Fintech field using AI and Big Data, two of the research areas that the Institute of Informatics and Telecommunications is extremely active.

Scientific Lead for NCSR-D

Programme: National Project (<https://www.iit.demokritos.gr/education-qualco-fellowships/> )

Start Date: 01/03/2022 Duration: 24 months

NCSR-D Budget: 500,000 €

## 7.2 Completed Projects

### EU Projects

Out of this long list of projects, I would like to stress some of the recently completed ones (as of 2018):

- Projects related to the European AI-on-demand platform: ExtremeEarth, AI4EU
- Research infrastructures: DARE (coordinator), Fair4Fusion
- Robotics: RADIO (coordinator), iRTA
- Big Data: Big Data Europe
- Supporting journalists and tackling disinformation: Your Data Stories, Data Stories, Open Journalism, StoryBot

### **ExtremeEarth: From Copernicus Big Data to Extreme Earth Analytics.**

Copernicus is the European program for monitoring the Earth. The geospatial data produced by the Sentinel satellites puts Copernicus at the forefront of the Big Data paradigm, giving rise to all the relevant challenges: volume, velocity, variety, veracity and value. ExtremeEarth concentrates on developing the technologies that will make Europe a pioneer in the area of Extreme Earth Analytics i.e., the Remote Sensing and Artificial Intelligence techniques that are needed for extracting information and knowledge out of the petabytes of Copernicus data. The research and innovation activities undertaken in ExtremeEarth will significantly advance the frontiers in Big Data, Earth Analytics and Deep Learning for Copernicus data and Linked Geospatial Data, and make Europe the top player internationally in these areas. The ExtremeEarth technologies will be demonstrated in two use cases with societal, environmental and financial value: the Food Security use case and the Polar use case.

Scientific Lead for NCSR-D

Programme: H2020 Project (<https://earthanalytics.eu/> )

Start Date: 01/01/2019 Duration: 36 months

NCSR-D Budget: 426,250 €

### **AI4EU: A European AI On Demand Platform and Ecosystem**

AI4EU will efficiently build a comprehensive European AI-on-demand platform to lower barriers to innovation, to boost technology transfer and catalyse the growth of start-ups and SMEs in all sectors through open calls and other actions. The platform will act as a broker, developer and one-stop shop providing and showcasing services, expertise, algorithms, software frameworks, development tools, components, modules, data, computing resources, prototyping functions and access to funding.

Training will enable different user communities (engineers, civic leaders, etc.) to obtain skills and certifications. The AI4EU Platform will establish a world reference whilst interoperable with existing AI and data components and platforms. It will mobilize the whole European AI ecosystem and already unites 80 partners in 21 countries including researchers, innovators and related talents.

Scientific Lead for NCSR-D

Programme: H2020 Project (<https://www.ai4europe.eu/> )

Start Date: 01/01/2019 Duration: 36 months

NCSR-D Budget: 105,625 €

**DARE: Delivering Agile Research Excellence on European e-Infrastructures**

DARE (Delivering Agile Research Excellence on European e-Infrastructures) aims to provide scientific communities with a unifying hyper-platform and development context to allow for user-friendly and reproducible carrying out of huge data-driven experiments, and rapid prototyping. DARE specifically addresses the requirements of innovating teams of research developers and scientists, who work on the intersection of software engineering and scientific domains, and on data, complexity and computing extremes. Building on extensive experience in research e-infrastructures, semantification and the handling of metadata, and on bigdata technologies and domain applications, DARE will equip teams of innovators with meaningful abstractions and tools allowing for rapid prototyping of reproducible and efficient research solutions. DARE will improve further and integrate tried and tested programmatic dataflow specification APIs, big-data technologies and provenance/data-lineage solutions to address the requirements of European RIs, initially of EPOS, on Earth science, and IS/ENES2, on climate.

Project Coordinator

Programme: H2020 Project (<http://project-dare.eu/> )

Start Date: 01/01/2018 Duration: 36 months

NCSR-D Budget: 440,000 €

**Fair4Fusion: Fair for Fusion - open access for fusion data in Europe**

The European fusion community has become increasingly collaborative over the last few decades with more experimental devices becoming available for broader groups of researchers. The diversity of devices is a great strength of the programme, but as each facility largely has developed their own data technologies, philosophies and access methodologies it has in some cases also presented challenges in sharing data even between collaborating scientists. Opening the data up and making them more easily available on a pan-European basis is a key ingredient in exploiting the investments in the research infrastructures made so far. We aim in this proposal to achieve all of the goals specified in this call by not only providing a reference architecture for such an open data platform, but to both demonstrate and elicit feedback from existing users within the fusion domain, to ensure they are both exposed to the benefits of such an open science approach and that we are able to obtain feedback to provide input into the design.

Scientific Lead for IIT-NCSR-D

Programme: H2020 Project (<https://fair4fusion.eu/>)

Start Date: 01/09/2019 Duration: 24 months

NCSR-D Budget: 280,000 €

### **RADIO: Robots in assisted living environments: Unobtrusive, efficient, reliable and modular solutions for independent ageing.**

In RADIO, we develop an integrated smart home/assistant robot system, with the objective of pursuing a novel approach to acceptance and unobtrusiveness: a system where sensing equipment is not discrete but an obvious and accepted part of the user's daily life. By using the integrated smart home/assistant robot system as the sensing equipment for health monitoring, we mask the functionality of the sensors rather than the sensors themselves. In this manner, sensors do not need to be discrete and distant or masked and cumbersome to install; they do however need to be perceived as a natural component of the smart home/assistant robot functionalities.

#### Project Coordinator

Programme: EU ICT project- H2020 (<http://www.radio-project.eu/> )

Start Date: 01/04/2015 Duration: 36 months

NCSR-D Budget: 770,000 €

### **iRTA: intelligent Robotic high-precision Treatment Application in rough terrain vineyards**

iRTA aims to build a smart spraying apparatus tailored to the intricacies of treatment application in rough and steep slope terrains and on cultivations of high variability between plants, as is the grape. To achieve this, iRTA will combine state-of-the-art technologies with features that fully adhere to the requirements of the usage setting and integrate them into a flexible robotic platform. Namely, iRTA will augment the robotic platform with sophisticated software for autonomous localisation, navigation and obstacle avoidance, in order to enhance its traversability and ensure its safe operation in rough environments with the simultaneous presence of human workers.

#### Scientific Lead for NCSR-D

Programme: H2020 Project (<https://irta.agenso.gr/> )

Start Date: 01/05/2020 Duration: 18 months

NCSR-D Budget: 20,000 €

### **YDS: Your Data Stories**

YourDataStories brings an innovative solution whose innovation potential spreads across many directions from leveraging best practices and proven technologies across Europe, to exploiting the social Web for accessing citizens, and to supporting sustainable public services across borders. Building on top of the "Transparency Portal" initiative of the Greek government, YourDataStories can be viewed as a way to showcase and transfer the existing expertise to European level, in an attempt to transform governments and governance in Europe. At the same time, YourDataStories seeks to exploit and embed in this effort the benefits of the social Web, establishing an innovative bidirectional channel between the Social and Semantic Web. Finally, YourDataStories aims to support sustainable services, supported by a marketing ecosystem of applications offering cross-border services of public finance flows across Europe.

#### Scientific Coordinator

Programme: EU ICT project- H2020 (<https://yourdatastories.eu>)

Start Date: 01/02/2015 Duration: 36 months

NCSR-D Budget: 535,000 €

## **DataStories**

DataStories seeks to provide a solution that will equip journalists with skills required for data journalism, enabling them to analyse flows of data and bring sense and structure to it. It will help to extract facts and insights, revealing the “hidden” stories that the data brings up, providing the context to support and shape journalist’s future stories.

### Scientific Lead for NCSR-D

Programme: Google/Other international projects  
(<https://www.iit.demokritos.gr/projects/datastories/> )

Start Date: 01/12/2018 Duration: 24 months

NCSR-D Budget: 185,000 €

## **OpJ: Open Journalism**

Fake news emerges as an important problem for journalism and democracy, building on the growing loss of confidence in media. A potential solution could be to create more and better evidence-based stories that are supported by open data and readers can directly refer to original sources. OpJ will try to strengthen the re-usability of open data by journalists through the following toolkit: (a) Company name matching and advanced search in public procurement, (b) 1-click provenance to original data source and (c) News enrichment through data tags.

### Project Coordinator

Programme: Google DNI project (<https://www.iit.demokritos.gr/project/opj>)

Start: 13/10/2017 Duration: 12 months

NCSR-D Budget: 50,000 €

## **StoryBot: Automated workflows in news production towards robot-assisted journalism**

StoryBot aims to provide an integrated platform for automated news production and presentation (publications). We propose the idea of a bot that: allows the creation of an editorial plan, with a list of topics of interest; collects and aggregates web content (including content from social media) in real time for each topic of interest; highlighting basic entities from each story; allows journalists to combine and edit content from various sources into a single story; publishes the news story in the format and channel chosen by the journalist.

### Scientific Lead for NCSR-D

Programme: Google DNI project (<https://www.iit.demokritos.gr/project/storybot>)

Start Date: 23/01/2017 Duration: 21 months

NCSR-D Budget: 144,000 €

## **BigDataEurope: Integrating Big Data, Software & Communities for Addressing Europe's Societal Challenges.**

BigDataEurope focuses on providing an integrated stack of tools to manipulate, publish and use large-scale data resources; tools that can be installed and used freely in a customised data processing chain

with minimal knowledge of the technologies involved and integrating and industrially hardening key open-source Big Data technologies and European research prototypes into a Big Data Integrator Platform.

Scientific Lead for NCSR-D

Programme: EU ICT project- H2020 (<http://www.big-data-europe.eu/>)

Start Date: 01/01/2015 Duration: 36 months

NCSR-D Budget: 613,125 €

**EU–Pri: An approach how to teach citizenship education in the prison**

EU – Pri aims to enrich the knowledge of adult students-inmates about civic and politic issues, and cultivate the appropriate skills, values and attitudes relative to their citizenship. The project will be implemented at the premises of a Second Chance School located in a prison in Athens and includes the implementation of workshops with the use of technological sciences, like robotics, Artificial Intelligence and 5G Networks.

Scientific Lead for NCSR-D (Project Manager)

Programme: Other European Projects (<http://eu-pri.demokritos-dev.eu/>)

Start Date: 22/06/2020 Duration: 12 months

NCSR-D Budget: 29,999 €

**PREPARE: Innovative integrative tools and platforms to be prepared for radiological emergencies and post-accident response in Europe.**

This project aims to close gaps that have been identified in nuclear and radiological preparedness following the first evaluation of the Fukushima disaster. It addresses the call Fission-2010-3.3.1: Update of emergency management and rehabilitation strategies and expertise in Europe. SKEL in cooperation with the Environmental Research Laboratory (EREL) and the Nuclear Research Reactor Laboratory (NRRL) developed the computational infrastructure for monitoring social media content and designed and implemented an ontology for nuclear and radiological incidents.

Scientific Lead for SKEL

Programme: EU FISSION project – FP7 (<https://www.iit.demokritos.gr/project/prepare>)

Start Date: 01/02/2013 Duration: 36 months

NCSR-D Budget: 290,000 €

**C2LEARN: Creative Emotional Reasoning Computational Tools Fostering Co-Creativity in Learning Processes.**

The C2Learn project aims to introduce an innovative digital gaming and social networking environment incorporating diverse tools, the use of which can foster co-creativity in learning processes in the context of both formal and informal educational settings. The C2Learn environment is an open-world “sandbox” (non-linear) virtual space enabling learners to freely explore ideas, concepts, and the ‘shared’ knowledge available on the semantic web and the virtual communities in which they participate.

Technical Coordinator

Programme: EU ICT project – FP7 (<http://www.c2learn.eu/>)

Start Date: 01/11/2012 Duration: 36 months

NCSR-D Budget: 650,158 €

**SEMAGROW: Data intensive techniques to boost the real-time performance of global agricultural data infrastructures.**

SemaGrow developed: scalable and robust semantic storage and indexing algorithms; query decomposition, source selection, and distributed querying methods to implement a scalable and robust infrastructure for data service federation; and tested its components and overall architecture over real, complex, interconnected datasets comprising data and document collections, sensor data, and GIS data.

Scientific Coordinator

Programme: EU ICT project – FP7 (<http://www.semagrow.eu/>)

Start Date: 01/11/2012 Duration: 36 months

NCSR-D Budget: 715,243 €

**POSCON: Positive Online Content and Services for Children in Europe.**

The thematic network POSCON aimed at: exchanging good practices, issues and challenges in provision of online content to young children; discussing feasibility and requirements of a safe browser for kids / collation of white lists including suggestions on moderation and rating of websites for children; providing a report with overview on the market for positive content for children in Europe.

Scientific Lead for NCSR-D

Programme: EU SAFER INTERNET thematic network project (<http://www.positivecontent.eu/>)

Start: 01/11/2012 Duration: 26 months

**USEFIL: Unobtrusive Smart Environments for Independent Living.**

Although ICT technologies can increase safety, independence and quality of life of elderly people while staying at home the adoption rates of such advancements show that these are still undesired by the majority of the population. USEFIL project intends to cope with this gap proposing advanced but affordable in-home unobtrusive monitoring and web communication solutions. More specifically USEFIL intends to use low cost off-the-shelf technology to develop immediate applicable services that will assist the elderly in maintaining their independence and their daily activities. NCSR-D has the project management, involving CIL and SKEL from IIT.

Scientific Lead for SKEL

Programme: EU ICT project – FP7 (<http://www.usefil.eu/>)

Start Date: 01/10/2011 Duration: 36 months

NCSR-D Budget: 725,519€

**NOMAD: Policy Formulation and Validation through non-moderated crowdsourcing.**

The ability to leverage the vast amount of user-generated content for supporting governments in their political decisions requires new ICT tools that will be able to analyse and classify the opinions expressed on the informal Web, or stimulate responses, as well as to put data from sources as diverse as blogs, online opinion polls and government reports to an effective use. To this end, NOMAD aims



to introduce these different new dimensions into the experience of policy making by providing decision-makers with fully automated solutions for content search, selection, acquisition, categorisation and visualisation that work in a collaborative form in the policy-making arena.

Technical Coordinator

Programme: EU ICT project – FP7 (<http://www.nomad-project.eu/>)

Start Date: 01/01/2012 Duration: 36 months

NCSR-D Budget: 508,463€

**CPS: Medium: A Novel Human Centric System to Improve Motor/Cognitive Assessment and Enable Adaptive Rehabilitation.**

The objective of this research is to develop methods and tools for a multimodal and multi-sensor assessment and rehabilitation game system called CPLAY for children with Cerebral Palsy (CP). CPLAY collects and processes multiple types of stimulation and performance data while a child is playing. The approach is to model the process as a cyber-physical system (CPS) feedback loop whereby data collected from various physical 3D devices (including fNIR brain imaging) are processed into hierarchical events of low-to-high semantic meaning that impact/ adjust treatment decisions. The project was coordinated by the University of Texas at Arlington (UTA). SKEL participated at UTA subcontractor in the context of our joint research program.

Scientific Lead for SKEL

Programme: USA NSF project (<https://www.iit.demokritos.gr/project/cps>)

Start Date: 15/09/2010 Duration: 36 months

NCSR-D Budget: \$60,000

**AVISPIRE: Audio-Visual Speech Processing for Interaction in Realistic Environments**

AVISPIRE will work towards expanding the state-of-the-art in the topic of audio-visual speech processing from today's "toy" examples to realistic human-computer interaction in difficult, realistic environments like the classroom, the automobile, multimedia streams of broadcasted news, and during meetings in smart rooms. Work will focus on both robust extraction of visual speech information, as well as its efficient fusion with the acoustic modality.

Project Coordinator

Programme: FP7 - Marie Curie (International Reintegration Grants)

Start Date: 01/10/2009 Duration: 42 months

NCSR-D Budget: 175,000 €

**SYNC3: Synergetic Content Creation and Communication**

SYNC3 will provide an intelligent framework for making more accessible the vast quantity of user comments on news issues. The project will structure the part of blogosphere that refers to running news stories, rendering it accessible, manageable and re-usable. The immediate target of SYNC3 is the news industry and social networks, but domains like commerce, tourism, e-science and business intelligence are likely to benefit from the resulting technology.

Participated in the design of the information extraction system

Programme: FP7-ICT

Start Date: 01/04/2009 Duration: 36 months

NCSR-D Budget: 710,000 €

**CASAM: Computer-Aided Semantic Annotation of Multimedia**

CASAM expects to facilitate the synergy of human and machine intelligence to significantly speed up the task of human-produced semantic annotation of multimedia content. The project will deal with

the task of aggregating human and machine knowledge with the ultimate target of minimizing human involvement in the annotation procedure. Intelligent human-computer interaction is of central importance, and the concept of effort-optimized knowledge aggregation will be introduced. This as the task of reaching the desired result by requiring the least effort from the user.

*Participated in the design of the information extraction system and the annotation tools*

Programme: FP7-ICT  
Start Date: 01/04/2008 Duration: 36 months  
NCSR-D Budget: 831,850 €

***QUATRO Plus: Content Labels for User Empowerment***

Traditional quality labels and trustmarks are logos that are visible to humans but undetectable by machines. The original 2-year QUATRO project identified a demand for and the usefulness of interoperable, machine-readable quality labels; created a platform for their delivery and authentication; and developed two end-user tools. QUATRO Plus seeks to build on the work done and to extend its scope significantly, notably by allowing users to contribute to both the creation of labels and the trust that other users may put in them

*Technical Coordinator*

Programme: European Union's Safer Internet Plus, eContent  
Start Date: 01/10/2007 Duration: 24 months  
NCSR-D Budget: 200,521 €

***INDIGO: Interaction with Personality and Dialogue Enabled Robots***

INDIGO aims to develop human-robot communication technology for intelligent mobile robots that operate and serve tasks in populated environments. In doing so, the project will involve technologies from various sectors, and will attempt to introduce advances in respective areas, i.e. natural language interaction, autonomous navigation, visual perception, dialogue systems, and virtual emotions.

*Scientific Lead for NCSR-D*

Programme: FP6-IST Cognitive Systems  
Start Date: 01/02/2007 Duration: 30 months  
NCSR-D Budget: 223,260 €

***BOEMIE: Bootstrapping Ontology Evolution with Multimedia Information Extraction***

The BOEMIE project proposes a bootstrapping approach to knowledge acquisition, which uses multimedia ontologies for fused extraction of semantics from multiple modalities, and feeds back the extracted information, aiming to automate the ontology evolution process. BOEMIE methodology BOEMIE advocates an ontology-driven multimedia content analysis (semantics extraction from images, video, text, audio/speech) through a novel synergistic method that combines multimedia extraction and ontology evolution in a bootstrapping fashion.

*Lead of Information Extraction and Ontology Enrichment Team*

Programme: FP6-IST  
Start Date: 01/03/2006 Duration: 36 months  
NCSR-D Budget: 1,435,224.00 €

***MedIEQ: Quality Labeling of Medical Web Content using Multilingual Information Extraction***

Based upon state-of-the-art technology in the areas of web crawling and spidering, multilingual information extraction, semantic resources and quality labelling, MedIEQ will pave the way towards the automation of quality labelling process in medical web sites. MedIEQ will deliver tools that crawl the Web to locate medical web sites in seven different European languages (Spanish, Catalan, German,

English, Greek, Czech, and Finnish) in order to verify their content using a set of machine-readable quality criteria.

Project Coordinator

Programme: DG SANCO - eHealth  
Start Date: 01/01/2006 Duration: 36 months  
NCSR-D Budget: 324,802 €

**OntoSum: Ontology Management and Use to Support Summarization**

The OntoSum project is funded by the Greek government and supports three PhD students working on the following subjects:

- Ontology Learning from textual content and data bases.
- Ontology Coordination
- Ontology-based Multi Document Summarisation.

Project Coordinator

Programme: PENED Programme, 2003  
Start Date: 01/12/2005 Duration: 36 months  
NCSR-D Budget: 115,696 €

**SHARE: Mobile support for rescue forces, integrating multiple modes of interaction**

SHARE aims to develop a new type of advanced mobile service, called Push-To-Share, to support mobile content sharing by the participants of field operational teams, such as fire rescue forces. Push-To-Share is an innovative extension of the commonly used Push-To-Talk technology and provides a new concept for simple ways of complex communication, combining an easy-to-use interface with a comfortable delivery of multimedia content

Participation on the Design of Ontology Management System

Programme: [FP6-IST, "Applications & Services for the Mobile User and Worker"](#)  
Start Date: 01/11/2004 Duration: 36 months  
NCSR-D Budget: 445,150 €

**QUATRO: Quality Assurance and Content Description**

The Quatro project is applying semantic web technologies to trust-mark schemes and quality labels. Drawing on past and original research, the project has defined a vocabulary that can be used by any trust-mark scheme and a technical platform to deliver the trust-marks in a format that can be processed by semantic web agents.

Responsible for SKEL tools design and development

Programme: European Union's Safer Internet Programme  
Start Date: 01/11/2004 Duration: 24 months  
NCSR-D Budget: 118,519 €

**CROSSMARC: Cross-lingual Multi-agent Retail Comparison.**

Development of technology for web content analysis. CROSSMARC technology was examined in four languages (Greek, English, Italian, and French), and two application domains (laptop offers, job offers). CROSSMARC developed an infrastructure that facilitates the integration of new tools and the adaptation to new domains.

Deputy project coordinator, WP3 Leader (Multilingual and Multimedia Fact Extraction), which provided the core information extraction technologies for all four languages supported by the project

Programme: Human Language Technologies, Information Society Technologies (Fifth Framework)  
Start Date: 01/01/2001 Duration: 30 months  
NCSR-D Budget: 847,264 €

**Web-C-Mine: Web usage mining from proxy/cache server logs**

Development of technology for processing large-scale usage data collected by Internet Service Providers (ISP), in order to discover knowledge from these data. This knowledge is used to model the ISP users.

Scientific Lead for NCSR-D

Programme: Bilateral Cooperation Greece-Cyprus (2001-2003).  
Start Date: 01/01/2001 Duration: 24 months  
NCSR-D Budget: 8,780 €

**SCOFI (Filtering the Internet by use of a Smart card). Ευρωπαϊκό έργο IAP (2001-2003)**

SCOFI developed a system for filtering web pages containing harmful content for children. The system is based on smart cards technology and exploits techniques for multimedia content analysis.

Participation in the design of the information filtering system.

**M-PIRO (Multi-lingual Personalised Information Objects). IST (2000-2003)**

The M-PIRO project developed state of the art techniques and tools in natural language generation, speech synthesis, user modelling, and their interaction with adaptive hypermedia and virtual reality systems. The project built on existing museum collection information database systems and utilised the information management and design expertise from the museum partners. The M-PIRO software creates descriptions of museum artefacts automatically, using information stored in a database. Children, adults and experts all receive slightly different, personalised, descriptions.

Participation in the design of language tools and resources of the natural language generation system, in the design of the authoring tool developed for creating and maintaining the common descriptions database.

**ADIET (Adaptive Information Extraction Technology). Bilateral Cooperation Greece-France (1999-2001)**

Development of a tool for the customization of Named-Entity Recognition Systems in different languages, with the use of Machine Learning methods. The collaboration with the French ICDC company was crucial for the success of the CROSSMARC proposal

Responsible for coordination of all the project tasks

**ANET (Adaptive Named-Entity Recognition Technology). Bilateral Cooperation Greece-Italy (1999-2001)**

Development of a Named-Entity Recognition System for Greek, Italian and English, using Machine Learning methods.

Responsible for coordination of all the project tasks

**GIE (Greek Information Extraction). Έργο διακρατικής συνεργασίας Ελλάδας – Μ. Βρετανίας (1997-1999)**

In GIE NCSR and Sheffield worked for the development of a prototype named entity recogniser for the Greek language and for the domain of management succession events. They also developed tools to

facilitate the customisation of named entity recognition in new domains for both English and Greek languages.

Scientific supervision for the development of named entity recognition modules and machine learning techniques.

**ECRAN (Extraction of Content: research at near-market)  
Language Engineering (1995-1999)**

ECRAN advances a key research technology and is a first step towards the personal newspaper and the active e-mail system, long awaited to deal with information overload on citizens with electronic access. ECRAN outcomes led to further funding from the MITOS, AUTONOMA, CROSSMARC, ANET, and ADIET projects.

Scientific supervision of the development of tools for adapting information extraction tools in new domains and of the user modelling system integrated with the ECRAN information extraction platform.

**GLOSSASOFT: Methods and Guidelines for Interlinguality in Software Construction.  
Telematics-Language Research Engineering (1993-1995)**

The objectives of the project were: to produce guidelines for the internationalization of new and existing software applications; produce guidelines, methods and to specify tools for the localization of internationalized software applications; apply these results on several case studies; promote the adoption of its results by relevant organizations/associations and IT companies. GLOSSASOFT results were recorded in a book titled "Software without Frontiers".

Participation in the methodological design, and the provision of internationalisation and localisation guidelines. Responsible for developing an application for multilingual dynamic generation of diagnostic and informative messages in software.

**A System for Knowledge Extraction from Texts – PAVE Project  
INFOGROUP S.A. (1992)**

Implementation of the knowledge extraction system

### *National projects*

Out of this list of national projects, I would like to stress two of the recently completed ones (as of 2021):

- The flagship action on Precision Medicine (this contributed the computational infrastructure to the on-going flagship action for SARS-CoV-2; the resulting infrastructure will be maintained and extended through coming national projects on precision medicine)
- The national research infrastructure for digital humanities and language technology Apollonis (this is the national part of the relevant European research infrastructures DARIAH and CLARIN)

**Hellenic Network for Precision Medicine, Subproject 5: "Infrastructures, Tools, and Systems for Organization, Processing, and Analysis of Biomedical Data"**

The project will design and develop the IT infrastructure and the software tools to collect, process and analyse biomedical data in order to support the standardization, and the effective and efficient

execution of sequence analysis and diagnostic workflows performed in Precision Medicine Units (PMU) in Greece. Moreover, the project will design and develop tools to support tasks related to clinical diagnosis, as well as to support administration tasks in PMUs.

The IT infrastructure will provide the following digital services:

- Editing and management of doctors' referrals and labs' sample data
- Data processing, storage and integration to support all steps of NGS analysis for precision medicine (sequence data production, generation of variant calling data, variant annotation and interpretation)
- Automatic execution of NGS analysis workflows for precision medicine
- Search, exploration and analytics on NGS data and related clinical data collected from diagnostic workflows performed in PMUs
- Support diagnostic guidelines for precision medicine by harvesting data from external data sources (digital libraries and clinical databases).

Scientific Lead for NCSR-D

Programme: NSRF / National Project (<https://www.iit.demokritos.gr/projects/hellenic-network-for-precision-medicine/> )

Start Date: 22/08/2018 Duration: 36 months

NCSR-D Budget: 197,500 €

**APOLLONIS: National infrastructure for Digital Humanities and Language Technology**

Exploiting the results of a series of previous projects, such as the Clarin-el national infrastructure, SentIMAGi, YourDataStories, BigDataEurope, SKEL will maintain and upgrade existing web services for language processing, will develop visualization services, collaborative text annotation services, web-based services for storing, indexing and searching in text repositories, and will validate these services in pilot applications for the analysis of open and linked data.

Scientific Lead for NCSR-D

Programme: NSRF / National Project (<https://www.iit.demokritos.gr/project/Apollonis>)

Start Date: 01/11/2017 Duration: 48 months

NCSR-D Budget: 240,000 €

**SentIMAGi: Brand monitoring and reputation management via multi-modal sentiment analysis**

SentIMAGi created a brand monitoring and reputation management framework, exploiting multi-modal sentiment analysis methods and summarization. The aim of the framework is to provide an efficient but complete view of the public sentiment towards different aspects of a brand. We break the text-only barrier by fusing the information conveyed via textual and visual content under a unified analysis methodology. SentI-MAGi also applies summarization and text mining techniques to provide efficient yet complete reports through intuitive visualizations.

Scientific Coordinator

Programme: NSRF / National Project (<https://www.iit.demokritos.gr/project/sentimagi>)

Start Date: 01/07/2014 Duration: 15 months

NCSR-D Budget: 155,628 €

**AMINESS: Analysis of marine information for environmentally safe shipping.**

The project objective was the development of a web portal offering access to ship owners, policy makers and the scientific community, to (a) suggest vessel and environmentally optimal safe route planning (b) deliver real-time alerts for ships and (c) support policy recommendations. The portal is based on historical and real-time maritime data, including real-time information for ship position and speed, weather and sea forecasting and land and sea location. NCSR-D, through CIL and SKEL labs, coordinated the project.

Scientific Lead for SKEL

Programme: GSRT/Ministry of Development - National project (<http://aminess.eu/>)

Start: 01/05/2013 Duration: 26 months

NCSR-D Budget: 300,000€

**CLARIN-EL: CLARIN ATTIKI – Support and development of Greek partners for the participation in the European Research Infrastructure Consortia**

CLARIN-EL is the national Research Infrastructure on language technology. Its objective was the creation of software for the storage and disposal of Language Resources and Technologies, conversion of Language Resources and Technologies aimed at interoperability, description / documentation of Language Resources and Technologies according to the agreed metadata schema, list of available Language Resources and Technologies. SKEL was responsible for the design and implementation of the infrastructure of the Language Technologies, including the local repository of the language tools, their web services and their Web UI.

Scientific Lead for NCSR-D

Programme: NSRF / National Project (<http://www.clarin.gr/>)

Start Date: 01/11/2012 Duration: 35 months

NCSR-D Budget: 199,766.71€

**CLARIN-EL-PREP (CLARIN-EL Preparatory phase).**

This is the preparation stage for the design of the national research infrastructure on language technology, being part of the European research infrastructure CLARIN.

Scientific Lead for NCSR-D

Programme: NSRF / National Project

Start Date: 2011 Duration: 12 months

NCSR-D Budget: 7,875 €

**XENIOS - Human-robot interaction using speech processing, natural language generation, and computer vision**

Scientific Lead for NCSR-D

Programme: NSRF/ National project

Start Date: 13/06/2006 Duration: 18 months

NCSR-D Budget: 63,500 €

**MITOS: Document filtering, information extraction and data-mining applied to financial news  
National EPET Project (1999-2001)**

MITOS addressed the problem of information overload by developing a system able to filter and extract information from electronic news articles, as well as to discover new knowledge implicitly stored in databases. The system was tested with news and data from the Greek financial market.

*Deputy coordinator, WP8 leader (information extraction module)*

**SCHEMATOPOIESIS - Integrated environment for the development and exploitation of Greek controlled languages**

**National EPET Project (1999-2001)**

SCHEMATOPOIESIS developed the first Greek prototype style checker to assist Greek technical writers as well as to facilitate translation from Greek to other languages. The project covered technical documents from the domain of computational equipment.

*Responsible for the design and development of linguistic tools and resources, development of the authoring MS-Word plugin*

**AUTONOMA: Automatic Acquisition of Named-Entity Recognition Grammars for Greek**

Use of grammar induction methods for the acquisition of Named-Entity grammars in Greek.

*Participated in the design and development of the symbolic machine learning methodologies.*

**Localisation of HP Visual User Environment (VUE). HP Tender, 1995**

*Development of the bilingual term database for the product*

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# 8

## EDUCATIONAL ACTIVITIES



## 8. EDUCATIONAL ACTIVITIES

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As presented in section 5.2, I have been actively involved in various education activities (I was responsible for IIT education issues from 2008 till 2019):

- Organisation of joint PhD programmes with Greek and foreign Universities
- Organisation of joint MSc programmes with Greek Universities
- Organisation of abroad programmes and international summer schools
- Organisation of educational programmes for schools

In addition to the above activities/initiatives, I participated in the lecturing of various MSc courses for several years, and I supervised many doctoral, post-graduate and graduate theses and internships. These are presented below.

### ***MSc Courses Lectures***

- Cross-institute M.Sc. programme “Informatics in Medicine and Biology”, University of Athens, Technical University of Athens, Academy of Athens, NCSR “Demokritos”, 2015 – 2018: **Management of Biomedical Databases – 2<sup>nd</sup> Semester** (with G. Petasis and A. Krithara)
- M.Sc. Programme «Technoglossia V», University of Athens in collaboration with NTUA, 2009: **Information Extraction – 3<sup>rd</sup> Semester, Natural Language Generation – 4<sup>th</sup> Semester**
- M.Sc. Programme «Technoglossia IV», University of Athens in collaboration with NTUA, 2006: **Natural Language Generation – 4<sup>th</sup> Semester, Information Extraction – 3<sup>rd</sup> Semester**
- M.Sc. Programme «Technoglossia III», University of Athens in collaboration with NTUA, 2004: **Information Extraction – 3<sup>rd</sup> Semester**
- M.Sc. Programme «Technoglossia II», University of Athens in collaboration with NTUA, 2003: **Natural Language Generation – 4<sup>th</sup> Semester, Information Extraction – 3<sup>rd</sup> Semester**
- M.Sc. Programme «Technoglossia I», University of Athens in collaboration with NTUA, 2001: **Natural Language Generation – 4<sup>th</sup> Semester**

### ***Supervision of PhDs, (Post-) Graduate Theses and Internships***

**Supervision of PhDs** (the ones where I served solely as a member of the supervising committee are not included)

- 1) Koukourikos Antonios, «**Information Extraction and Semantic Linkage of Heterogeneous Knowledge Sources**», Supervisor: V. Karkaletsis. In collaboration with the Department of Digital Systems, University of Piraeus (in progress)
- 2) Davettas Athanasios, «**Deep learning for combining heterogeneous data**», Supervisors: V. Karkaletsis, I.A. Klampanos. In collaboration with the Informatics & Telecommunications Department, University of the Peloponnese, and DANAOS under the Stavros Niarchos Foundation Industrial Scholarship Programme (completed in 2021)
- 3) Pittaras Nikofors, «**Beyond Deep Learning**», Supervisors: V. Karkaletsis, G. Giannakopoulos. In collaboration with the Informatics & Telecommunications Department, University of Athens, and ATC under the Stavros Niarchos Foundation Industrial Scholarship Programme (completed in 2021)

- 4) Papacostas Michail «**Deep learning and machine learning applications for user-behavior modeling & monitoring**», Supervisor: V. Karkaletsis. In collaboration with the Computer Science & Engineering Department, University of Texas at Arlington (UTA), “Demokritos” international fellowship PhD program (completed in 2019)
- 5) Tsiakas Constantine «**Interactive Learning and Adaptation for Personalized Robot-Assisted Training**», Supervisor: V. Karkaletsis. In collaboration with the Computer Science & Engineering Department, University of Texas at Arlington (UTA), joint PhD programme (“Demokritos” international fellowship PhD program) (completed in 2018)
- 6) Papaggelis Alexandros, «**Adaptive Dialogue Systems**», Supervisor: V. Karkaletsis. In collaboration with the Computer Science & Engineering Department, University of Texas at Arlington (UTA), “Demokritos” international fellowship PhD program, (completed in 2013)
- 7) Rentoumi Vassiliki, «**Sentiment Analysis on Metaphorical Languages**», Supervisor: V. Karkaletsis. In collaboration with the University of the Aegean, Department of Information and Communication Systems Engineering (G. Vouros) (completed in 2012)
- 8) Spiliopoulos Vassilis «**Automatic Ontology Coordination**». Supervisor: V. Karkaletsis. In collaboration with the University of the Aegean, Department of Information and Communication Systems Engineering (G. Vouros) (completed in 2009)
- 9) Giannakopoulos Georgios «**Automatic Summarisation from Multiple Documents**». Supervisor: V. Karkaletsis. In collaboration with the University of the Aegean, Department of Information and Communication Systems Engineering (G. Vouros) (completed in 2009)
- 10) Valarakos Alexandros «**Ontology Creation using Machine Learning**». Supervisors: Κ.Σπυρόπουλος, V. Karkaletsis. In collaboration with the University of the Aegean, Department of Information and Communication Systems Engineering (G. Vouros) (completed in 2009)
- 11) Afantenos Stergios, «**Automatic Document Summarisation**». Supervisor: V. Karkaletsis. In collaboration with the University of Athens, Department of Informatics and Telecommunications (P. Stamatopoulos) (completed in 2006)

I also supervised a large number of MSc/BSc theses and internships. The relevant information is found at <http://karkaletsis.iit.demokritos.gr/Supervision-of-Students/>

9

# PUBLICATIONS



## 9. PUBLICATIONS

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### *White Papers*

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### *Editorials*

1. V. Karkaletsis, S. Konstantopoulos, N. S. Voros, R. Annicchiarico, M. Dagioglou, C. P. Antonopoulos (Editors), RADIO—Robots in Assisted Living: Unobtrusive, Efficient, Reliable and Modular Solutions for Independent Ageing, Springer, Cham, 2019.
2. V. Karkaletsis, M.A. Mayer, P. Karampiperis, (Guest Editors Special Issue) "Semantic Descriptions of Medical Web Resources: Technologies to support their Creation, Maintenance and Access" Health Informatics Journal (HIJ), June 2011, 17(2): 91-94.
3. S. Konstantopoulos, S. Perantonis, V. Karkaletsis, C.D. Spyropoulos, G. Vouros, (Editors) Proceedings of 6th Hellenic Conference on Artificial Intelligence (SETN-2010) "Artificial Intelligence: Theories, Models and Applications", Springer LNAI 6040, Athens, 4-7 May 2010.
4. S. Guergana, G. Angelova, V. Karkaletsis, (Editors) Proceedings of the Workshop "Biomedical Information Extraction", Recent Advances on Natural Language Processing (RANLP 2009), September 18, 2009, Borovets, Bulgaria.
5. S. Konstantopoulos, V. Karkaletsis, C. Matheson, J. Oberlander, (Editors) Proceedings of the International Workshop on Computational Aspects of Affective and Emotional Interaction (CAFFEi 08), 18th European Conference on Artificial Intelligence (ECAI 2008), July 21, 2008, Patras, Greece.
6. F. Makedon, V. Karkaletsis, and I. Maglogiannis, (Guest Editors Special Issue) "Computational Analysis and Decision Support Systems in Oncology", International Journal of Oncology Reports, 2006, 15: 969-1108.
7. C.D. Spyropoulos and V. Karkaletsis, (Guest Editors Special Issue) "Information Extraction and Summarization from Medical Documents", Artificial Intelligence in Medicine (AIM), Feb 2005, 33(2): 107-198.
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9. G. Paliouras, V. Karkaletsis and C.D. Spyropoulos (Editors), Machine Learning and Applications, Lecture Notes in Computer Science (LNCS) no. 2049, Springer-Verlag, 2001.
10. C.D. Spyropoulos and V. Karkaletsis, (Guest Editors Special Issue), "Artificial Intelligence and Software Multilinguality", Applied Artificial Intelligence (AAI) Journal, 1999, 13(6).

### *Journals*

1. Athanasios Davvetas, Iraklis A. Klampanos, Spiros Skiadopoulos, Vangelis Karkaletsis, Evidence Transfer: Learning Improved Representations According to External Heterogeneous Task

- Outcomes, In ACM Transactions on Knowledge Discovery from Data, Association for Computing Machinery (ACM), volume 16, (Pages: 1–22), 2022.
2. Iraklis Klampanos, Chrysoula Themeli, Alessandro Spinuso, Rosa Filgueira, Malcolm Atkinson, André Gemünd, Vangelis Karkaletsis, DARE Platform: a Developer-Friendly and Self-Optimising Workflows-as-a-Service Framework for e-Science on the Cloud, In Journal of Open Source Software, The Open Journal, volume 5, (Pages: 2664), 2020.
  3. Christos P. Antonopoulos, Georgios Keramidas, Nikolaos S. Voros, Michael Huebner, Fynn Schwiegelshohn, Diana Goehringer, Maria Dagioglou, Georgios Stavrinos, Stasinou Konstantopoulos, Vangelis Karkaletsis, Toward an ICT-Based Service Oriented Health Care Paradigm, In IEEE Consumer Electronics Magazine, volume 9, (Pages: 77-82), 2020.
  4. Nikiforos Pittaras, George Giannakopoulos, George Papadakis, Vangelis Karkaletsis, Text classification with semantically enriched word embeddings, In Natural Language Engineering, Cambridge University Press, (Pages: 1–35), 2020.
  5. Athanasios Davvetas, Iraklis A. Klampanos, Spiros Skiadopoulos, Vangelis Karkaletsis, The Effect of Evidence Transfer on Latent Feature Relevance for Clustering, In Informatics, MDPI, volume 6, (Pages: 17), 2019.
  6. Iraklis A. Klampanos, Athanasios Davvetas, Antonis Koukourikos, Vangelis Karkaletsis, ANNETT-O: an ontology for describing artificial neural network evaluation, topology and training, In International Journal of Metadata, Semantics and Ontologies (IJMSO), Inderscience, volume 13, (Pages: 179–190), 2019.
  7. Iraklis A. Klampanos, Athanasios Davvetas, Spyros Andronopoulos, Charalambos Pappas, Andreas Ikononopoulos, Vangelis Karkaletsis, Autoencoder-driven weather clustering for source estimation during nuclear events, In Environmental Modelling and Software, Elsevier, volume 102, (Pages: 84–93), 2018. [url] [doi]
  8. T. Goudas, C. Louizos, G. Petasis & V. Karkaletsis, "Argument Extraction from News, Blogs, and the Social Web", *International Journal on Artificial Intelligence Tools*, v. 24, pp. 287-299, (ISSN Print: 0218-2130, Online: 1793-6349)
  9. S. Konstantopoulos and V. Karkaletsis, System Personality and Adaptivity in Affective Human-Computer Interaction. *International Journal on Artificial Intelligence Tools*, 22(2). April 2013
  10. P. Karampiperis, G. Mouchakis, G. Paliouras, V. Karkaletsis, ER Designer Toolkit: A Graphical Event Definition Authoring Tool. *Universal Access in the Information Society (UAIS)*, Special Issue on Cognitive Systems for Assistive Environments, v. 13 (1), 2013
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  12. S. Konstantopoulos, P. Archer, P. Karampiperis, V. Karkaletsis. The POWDER Protocol as Infrastructure to Serving and Compressing Semantic Data. *International Journal on Metadata, Semantics, and Ontologies*, vol. 7(1), pp. 1-15, Inderscience, 2012
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- and Assistive Environments: Social Impact, Financial, Government and Privacy Issues”, 10(2): 179-193, 2011.
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  16. S. Castano, I.S.E. Peraldi, A. Ferrara, V. Karkaletsis, A. Kaya, R. Möller, S. Montanelli, G. Petasis, and M. Wessel. Multimedia Interpretation for Dynamic Ontology Evolution. *Journal of Logic and Computation*, 19 (5): 859-897, 2009.
  17. G. Giannakopoulos, V. Karkaletsis, G. Vouros, P. Stamatopoulos, Summarization System Evaluation Revisited: N-gram Graphs, *ACM Transactions on Speech and Language Processing*, 5(3): 1-39, 2008.
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  24. G. Sakkis, I. Androutsopoulos, G. Paliouras, V. Karkaletsis, C.D. Spyropoulos and P. Stamatopoulos, “A Memory-Based Approach to Anti-Spam Filtering for Mailing Lists,” *Information Retrieval Journal*, 6(1): 49-73, 2003.
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2. Nikiforos Pittaras, Stefano Montanelli, George Giannakopoulos, Alfio Ferrara, Vangelis Karkaletsis, Crowdsourcing in Single-document Summary Evaluation: The Argo Way, Chapter in Multilingual Text Analysis: Challenges, Models and Approaches, World Scientific, (Pages: 245-280), 2019.
3. Vangelis Karkaletsis, Stasinou Konstantopoulos, Nikolaos S. Voros, Roberta Annicchiarico, Maria Dagioglou, Christos P. Antonopoulos (Editors), RADIO–Robots in Assisted Living: Unobtrusive, Efficient, Reliable and Modular Solutions for Independent Ageing, Springer, Cham, 2019.
4. Theodoros Giannakopoulos, Stasinou Konstantopoulos, Georgios Siantikos, Vangelis Karkaletsis, A System of Recognition Services for Clinical Assessment, Chapter in RADIO–Robots in Assisted Living: Unobtrusive, Efficient, Reliable and Modular Solutions for Independent Ageing (Vangelis Karkaletsis et al., ed.), Springer, Cham, (Pages: 7–18), 2018.
5. Vangelis Karkaletsis, Stasinou Konstantopoulos, Nikolaos S. Voros, Introduction to the RADIO Project, Chapter in RADIO–Robots in Assisted Living: Unobtrusive, Efficient, Reliable and Modular Solutions for Independent Ageing (Vangelis Karkaletsis et al., ed.), Springer, Cham, (Pages: 1–4), 2018.
6. Giannakopoulos, T., Konstantopoulos, S., Siantikos, G. & Karkaletsis, V., "Design for a system of multimodal interconnected ADL recognition services. ", *Springer*, Springer International Publishing, Eds: Springer, Components and Services for IoT platforms: Paving the Way for IoT Standards, pp. 323-333, 2016
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8. E. Iosif, G. Petasis and V. Karkaletsis. "Ontology-Based Information Extraction under a Bootstrapping Approach." *Semi-Automatic Ontology Development: Processes and Resources*. IGI Global, 2012. 1-21.
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14. D. Pierrakos, G. Paliouras, C. Papatheodorou, V. Karkaletsis, M. Dikaiakos, "Web Community Directories: A New Approach to Web Personalization," In Berendt et al. (Eds.), "Web Mining: From Web to Semantic Web", Lecture Notes in Computer Science, n. 3209, pp. 113 – 129, Springer Verlag, 2004.
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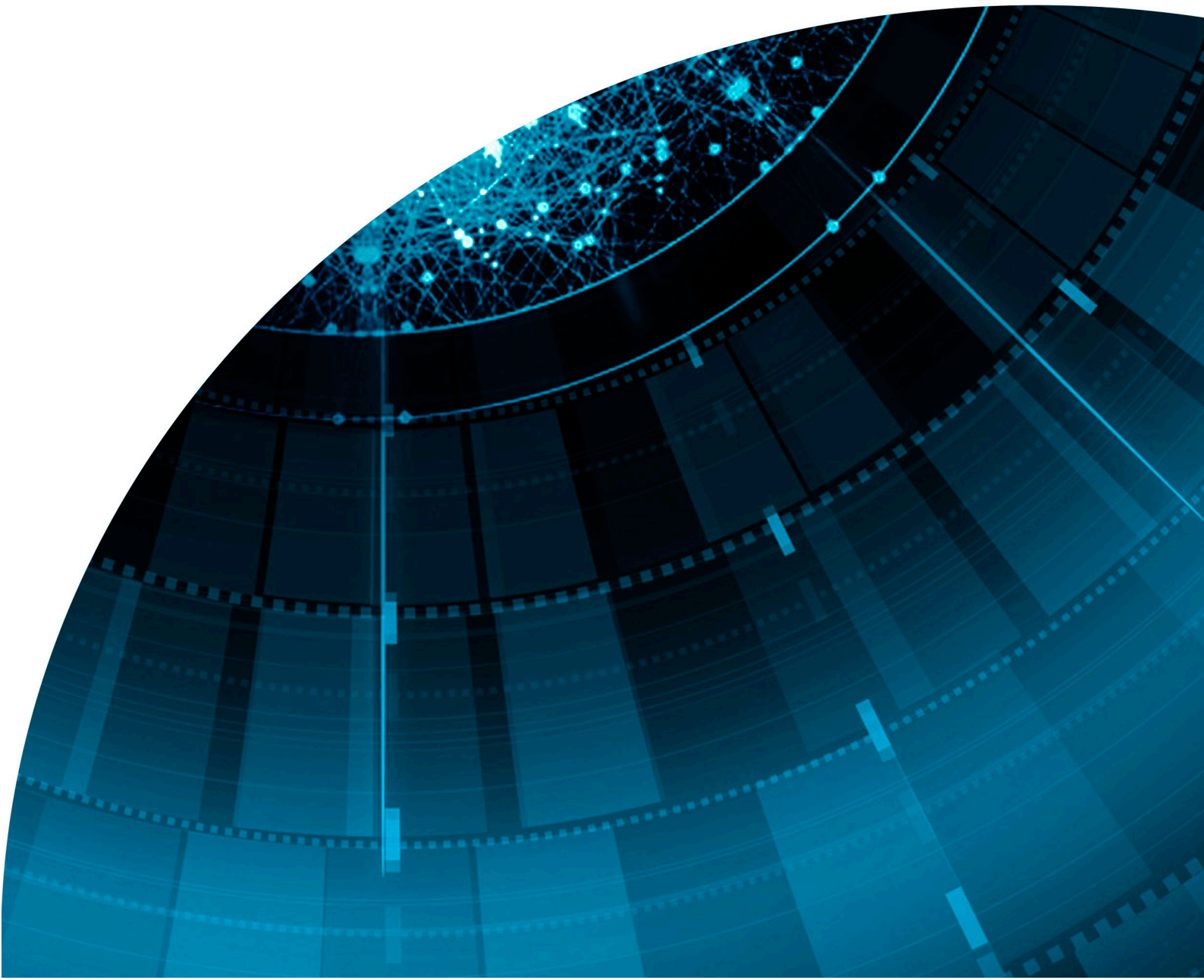
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10

# SCIENTIFIC CREDENTIALS



## 10. SCIENTIFIC CREDENTIALS

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### ***National Boards***

Since December 2019, I am a member of the **National Council of Research, Technology and Innovation** (ESETEK) (the Council Duty is for 3 years, 12/2019 – 12/2022).

Also, since April 2021, I am a member of the **National Committee for Bioethics & Technoethics** (the Committee duty is for 4 years, 04/2021 – 04/2025).

I had a coordinating role in the Board setup by the Ministry of Digital Governance for the formulation and operationalisation of the Hellenic National Strategy for Artificial Intelligence (10/2020 – 01/2021).

### ***International Scientific Journals***

#### *Editorial Board Member:*

Computer Speech & Language

Computational Intelligence Journal (till April 2022)

#### *Guest Editor in Special Issues:*

- Health Informatics Journal
- Journal of Artificial Intelligence in Medicine.
- International Journal of Oncology Reports
- Applied Artificial Intelligence

#### *Reviewer in International Scientific Journals, such as:*

- ACM Transactions on Information Systems
- Journal of Systems and Software
- Information Sciences
- Journal of Artificial Intelligence Tools
- Pattern Analysis & Applications
- Journal of Natural Language Engineering.
- Journal of Artificial Intelligence in Medicine.
- Applied Artificial Intelligence
- The Computer Journal
- Data & Knowledge Engineering
- Journal of Intelligent Information Systems
- Journal of Pattern Recognition Research

### ***Citations***

More than 5400 citations with h-index 34 and i-index 100 according to [Google Scholar](#).

### ***Chair, Committee Member in International and National Conferences***

1. Organiser of the IS-ENES3 Summer School on Data Science for Climate Modelling, 1-7 September 2022 at NCSR-D (<https://www.iit.demokritos.gr/is-enes-summer-school/>)
2. Chair of the AI4EU Ecosystem Development Forum, in the context of the H2020 AI4EU project, 21-22 November 2019, Athens (<https://www.iit.demokritos.gr/newsevents/the-ai4eu-event-ai-ecosystem-development-forum-was-successfully-held-in-athens/>)
3. Co-chair, IEEE Workshop on Spoken Language Technology, Athens, 18-21 December 2018 (<http://www.slt2018.org/>)
4. Co-organiser of BDE Workshop "SC5 Climate Workshop", Brussels, Belgium, 11/10/2016.
5. Co-organiser of Big Data in Secure Societies -1st Workshop, Brussels, Belgium, 30 September 2015 (<http://www.big-data-europe.eu/event/sc7-brussels-2015/>)
6. Organiser of the International Research-Centred Summer School in Cognitive Systems and Interactive Robotics, Data and Content Analytics (IRSS-2014), 3-30 July 2014.
7. Co-organiser of the 2nd SemaGrow Hackathon, NCSR-Demokritos, 4-7 July 2014
8. Co-organiser of Safer Internet Day Event, NCSR "Demokritos", 11 February 2014
9. Steering and Program Committee of the 7th International Conference on Pervasive Technologies Related to Assistive Environments (PETRA 2014), Rhodes, 27-30/05/2014
10. Program Committee of the Workshop on Language Technology for Cultural Heritage, Social Sciences, and Humanities (LaTeCH 2014), in conjunction with EACL 2014, Gothenburg /Sweden, 26-30 April 2014
11. Organiser of the International Research-Centered Summer School in Cognitive Systems and Interactive Robotics, Social Media and Digital Preservation (IRSS-2013), 4-31 July 2013.
12. Steering and Program Committee of the 6th International Conference on Pervasive Technologies Related to Assistive Environments (PETRA 2013), Rhodes, 28-31/05/2013
13. Scientific Committee of the 1st International Summer School on Open & Collaborative Governance, in conjunction with the 4th Samos Summit 2013 on Digital Innovation for Government, Business and Society, Samos, 1-6 July 2013
14. Program Committee of the Workshop on Language Technology for Cultural Heritage, Social Sciences, and Humanities (LaTeCH 2013) in conjunction with the 51st Annual Meeting of the Association for Computational Linguistics (ACL 2013).
15. Program Committee of the 17th Panhellenic Conference on Informatics (PCI-2013), Thessaloniki, September 2013
16. Steering Committee of the 5th International Conference on Pervasive Technologies Related to Assistive Environments (PETRA-2012)
17. Co-organiser of the CSE-UTA Study Abroad Program 2012
18. Program Committee of the Panhellenic Conference on Artificial Intelligence (ΣETN-2012).
19. Program Committee of the 6th Workshop on Language Technology for Cultural Heritage (LaTeCH 2012).
20. Program Committee of the 8th International Conference on Language Resources and Evaluation, LREC 2012

21. Program Committee of the 24th International Conference on Tools with Artificial Intelligence (ICTAI-2012)
22. Program Committee of the First International Workshop on Language Technology for Historical Text(s) (LTHisT-2012)
23. Steering Committee PETRA-2011
24. Co-organiser of the CSE-UTA Study Abroad Program 2011
25. Program Committee of the Language Technology for Cultural Heritage, Social Sciences, and Humanities Conference (LaTeCH 2011).
26. Steering Committee PETRA-2010
27. Co-presidency of the 6<sup>th</sup> Panhellenic Conference on Artificial Intelligence (ΣETN 2010), Athens, 4-7 May 2010.
28. President of the Organisational Committee of the European Conference on Computational Linguistics (EACL-2009), Athens, March 30 – April 3, 2009.
29. Steering and Program Committee of the 1<sup>st</sup> International Conference on Pervasive Technologies Related to Assistive Environments (PETRA-2008), Athens, July 15-19, 2008
30. Program Committee of the 5<sup>th</sup> European Semantic Web Conference (ESWC-2008)
31. Program Committee of the 6<sup>th</sup> Language Resources and Evaluation Conference (LREC-2008)
32. Program Committee of the 13<sup>th</sup> International Conference on Applications of Natural Language to Information Systems (NLDB-2008)
33. Program Committee of the 11<sup>th</sup> International Conference on User Modeling (UM-2007)
34. Program Committee of the IEEE International Conference on Tools with Artificial Intelligence (ICTAI-2007)
35. Program Committee of the ACL 2007 Workshop on Language Technology for Cultural Heritage Data (LaTeCH 2007)
36. Program Committee of the IEEE 21<sup>st</sup> International Conference on Advanced Information Networking and Applications (AINA-07)
37. Program Committee of the 6<sup>th</sup> International Semantic Web Conference and the 2<sup>nd</sup> Asian Semantic Web Conference (ISWC-2007)
38. Program Committee of the 4<sup>th</sup> IFIP Conference on Artificial Intelligence Applications & Innovations (AIAI-2007)
39. Program Committee of the European Semantic Web Conference (ESWC-2006)
40. Program Committee of the Workshop “Acquiring and representing multilingual, specialized lexicons: the case of biomedicine” at LREC-2006
41. Program Committee of the 3<sup>rd</sup> IFIP Conference on Artificial Intelligence Applications and Innovations (AIAI-2006)
42. Co-organiser of the Special Session “Semantics in Multimedia Analysis and Natural Language Processing”, AIAI-2006
43. Program Committee of the Panhellenic Conference on Artificial Intelligence (ΣETN-2006)
44. Program Committee of the 1<sup>st</sup> International Workshop on Representation and Analysis of Web Space (RAWS-2005)

45. Program Committee of the Workshop "Language and Speech Infrastructure for Information Access in the Balkan Countries" at RANLP-2005
46. Program Committee of the International Conference on "Adaptive Knowledge Representation & Reasoning" (AKRR-2005)
47. Program Committee of the Panhellenic Conference on Artificial Intelligence (ΣETN-2004)
48. Co-organiser of the Session on Computational Issues in Oncology and Molecular Biology, 9<sup>th</sup> World Congress on Advances in Oncology, 2004.
49. Co-organiser of the International Workshop "Balkan Language Resources and Tools", in conjunction with the Balkan Conference on Informatics BCI-2003
50. Organisation Committee and Ταμίας at the Panhellenic Conference on Artificial Intelligence (ΣETN-2002).
51. Program and Organisation Committee, Workshops Chair of the Advanced Course on Artificial Intelligence (ACAI-1999) of the European Coordinating Committee of AI (ECCAI), on "Machine Learning and Applications".
52. Co-organiser of the Special Session on "Adaptive and Multilingual Information Extraction – AMIE'98", in conjunction with the International Conference EURISCON-1998
53. Program and Organisation Committee of the IJCAI-97 Workshop "Multilinguality in Software Industry: the AI Contribution - MULSAIC'97"
54. Program and Organisation Committee of the ECAI-96 Workshop "Multilinguality in Software Industry: The AI Contribution (MULSAIC'96)".

### ***Invited Talks***

1. AI4Copernicus presentation at the AI4EU Stakeholder Forum, 9-10 December 2021, Bologna, Italy
2. Delphi Economic Forum event on "Changing Global Dynamics – Greece Leading into a New Era", 30 November 2021, Athens.
3. Open Science Days Conference, 21-22 October 2021, Athens.
4. Enabling AI & Earth Observation Innovation: Integrating AI4EU platform with DIAS platforms, AI4EU Café, 15 September 2021
5. Science & Technology in the Public Sphere' event, 19 March 2019, Athens.
6. Keynote speaker at the 30th IEEE CBMS 2017 conference, "Unobtrusive clinical monitoring with robots in AAL environments: the RADIO ecosystem", Thessaloniki, Greece 22-24 June 2017.
7. Keynote speaker at PETRA 2017 conference, "RADIO Home: an integrated smart home and assistant robot clinical monitoring environment", Rhodes, Greece 21-23 June 2017.
8. RADIO presentation at the iPerform meeting, University of Texas at Arlington, Arlington, USA, March 2016
9. "RADIO: Robots in Assisted Living Environments", Rice University, Houston, USA, 9 March 2016. (<http://www.cs.rice.edu/EventsList.aspx?EventRecord=28224>)
10. "Big Data Europe: the data integration layer", Rice University, Houston, USA, 9 March 2016. (<http://www.cs.rice.edu/EventsList.aspx?EventRecord=28225>)
11. YDS presentation, invited speaker at Viseo Grenoble, Grenoble, France, 16 June 2016.
12. Invited Talk in Big Data in Secure Societies – 2nd Workshop, Brussels, Belgium, 18 October 2016

13. Invited Speaker at the "11th International Workshop on Semantic and Social Media Adaptation and Personalization - SMAP 2016", Thessaloniki, Greece, 20-21 October 2016 (<http://smap2016.org/#/keynote/speakers/karkaletsis>).
14. Keynotes on data management (R&D projects SemaGrow and BigDataEurope) and argument extraction (R&D projects CLARIN-EL and NOMAD) in the context of research visits in US universities, 23-27 March 2015.
  - ✓ RICE University
  - ✓ University of Houston
  - ✓ University of North Texas at Denton
  - ✓ University of Texas at Arlington
  - ✓ University of Texas at Dallas
15. Panel speech, "Entrepreneurship and Innovation", 3rd Hellenic Forum for Science Technology and Innovation. NCSR "Demokritos", Athens, Greece, 3 July 2015<sup>2</sup>
16. "21<sup>st</sup> Century Technologies: A possible solution for current problems in the health sector", Greek Pasteur Institute, Athens, Greece, 20 February 2014.
17. "Entrepreneurship and Innovation Day, NCSR "Demokritos", Athens, Greece, 11 July 2014
18. "Positive content for children - the creative use of the internet", Karditsa, 3/4/2013
19. "Opportunities for research and educational cooperation with UNT – CSE", University of North Texas (UNT), Dept. of Computer Science & Engineering, 13/11/2013
20. "Opportunities for research and educational cooperation with UTDallas – CS", University of Texas at Dallas (UDallas), Dept. of Computer Science, 14/11/2013
21. "Roboskel - The robotics activity at the Institute of Informatics & Telecommunications of NCSR "Demokritos", University of Texas at Arlington Research Institute (UTARI)", 15/11/2013
22. "Opportunities for research and educational cooperation with UH – CS", University of Houston (UH), Dept. of Computer Science, 18/11/2013
23. "Semantics and Complex Systems", NTUA, 09/02/2012 (with S. Konstantopoulos & A. Provatou)
24. LREC2012 Tutorial: "Bootstrapping ontology evolution: a generic approach relying on ontology-based information extraction", 21/05/2012, Istanbul, Turkey (A. Krithara & G. Petasis)
25. Panhellenic Conference on Artificial Intelligence (EETN-2012), Lamia, 28-31/5/2012
26. 5th International Conference on Pervasive Technologies Related to Assistive Environments (PETRA), Crete, Greece, 6-8/6/2012
27. "Complex Systems: the KR perspective", NCSR "D" Interdisciplinary Co-operation Workshop, NCSR "Demokritos", 23/07/2012.
28. ICTAI2012 Tutorial: Bootstrapping Ontology Evolution. G. Petasis, A. Krithara, V. Karkaletsis, 07/11/2012, Athens.
29. 4th International Conference on Pervasive Technologies Related to Assistive Environments (PETRA), Crete, Greece, 25-27 May 2011
30. Safer Internet Day, 9-2-2010
31. University of North Texas, 2-3-2010

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<sup>2</sup> <https://www.iit.demokritos.gr/news/37-panel-discussion-entrepreneurship-and-innovation>

32. University of Dallas, 3-3-2010
33. University of Texas at Arlington, 4-3-2010
34. ILSP, 12-3-2010
35. Panel Discussion on Research Data and their Sharing, ΣETN-2010, 7-5-2010
36. CLARIN-EL Day in the National Research Foundation, 1-10-2010
37. Invited Talk, Department of Mediterranean Studies, University of the Aegean, Rhodes, 21-10-2010
38. Invited talk at Safer Internet Day, Greek Safer Internet Node, Athens, February 2009.
39. Opening and closing sessions as Local Organiser at the 12<sup>th</sup> Conference of the European Chapter of the Association from Computational Linguistics (EACL-09), 30 March – 3 April 2009.
40. Invited talks for multimedia information extraction and ontology evolution at the University of Goeteborg, 6-7 November 2008.
41. Invited talk for MedIEQ technology at the World of Health IT 08 Conference & Exhibition in Copenhagen, Denmark. MedIEQ's approach was presented and discussed during the session "Trust Model for Health Websites" on Wednesday, 5 November 2008.
42. Invited talk for MedIEQ technology at the Workshop "Language Technology in Biomedicine", organized by the Greek R&D project IATROLEXI, December 10, Athens, Greece, 2007.
43. "Quality Labelling of Medical Web Content: the MedIEQ project", Joint Meeting of the DG SANCO Health Systems Working Party and DG INFSO eHealth Working Group, Luxembourg, 21-22 June 2006
44. "Quality Labelling of Web Content", 3<sup>rd</sup> IFIP Conference on Artificial Intelligence Applications & Innovations (AIAI 2006), Athens, 7-9 June 2006
45. "Quality Labelling of Medical Web Content: the MedIEQ proposal", eHealth 2006, "Global Trends and Perspectives Session" Malaga, 10-12 May 2006
46. "Ontology Population with the use of Information Extraction Techniques", DaimlerChrysler Workshop on "Information and Relation Extraction for Text and Data Mining", Department for Data Mining at Daimler Chrysler Research & Technology, Ulm, Germany, 09-10 December 2005
47. "Intelligent content-based filtering and extraction". Invited speech at Dartmouth College, Dept of Computer Science, Dartmouth NH USA, April 1, 2004.
48. "CROSSMARC Technology", Summer Convention on Information Extraction 2002 (SCIE-2002), Frascati, Italy, July 2002.
49. "Information Extraction in the CROSSMARC project", CLASSiks Workshop, Dagstuhl, 1-2 October 2001.
50. "Research and Innovation Actions Management", Department of Financial & Management Engineering, University of the Aegean, Chios, Greece, May 2001
51. "Information Management in the Web", event on Visual Communication and Creative Expression, Great Britain Hotel, January 2001
52. "Intelligent Agents as Personal Assistants: Exploiting Natural Language Generation Techniques", Event on Intelligent Agents and Virtual Reality, Athens University of Economy and Business, June 2001.
53. "Textual Information Extraction", Department of Computer Engineering & Informatics, University of Patras, 23 February 1999.

### ***Scientific Societies***

**2006 – 2008:** Vice-president of the Hellenic Association for Artificial Intelligence.

**2004 – 2006:** Treasurer of The Hellenic Association of Artificial Intelligence.

**2000 – 2002:** Treasurer of The Hellenic Association of Artificial Intelligence.

### ***Standardisation Bodies***

Representative of NCSR “Demokritos” in the following working groups:

- Web Content Labelling Incubator Group (WCL), World Wide Web Consortium (W3C) (NCSR-D was one of the Group’s founders), (01/2006-10/2006)
- Protocol for Web Description Resources Working Group (POWDER), W3C. Extended WCL results to the relevant W3C specification (03/2007-09/2009).





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