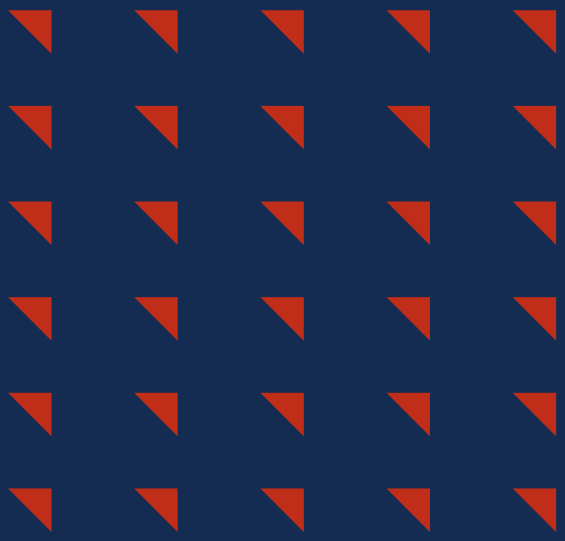
Singular Logic



R&D Annual Report

2023

2023 Overview

5
New Projects Launched

2+
Million Euros Funding

3
Representations in Major Events

4
Research Prototypes

4
Research Publications

R&D and Innovation

Preface

The year 2023 marked a significant milestone for our department with important achievements. Among our priorities, we have worked towards redefining our strategic roadmap to align our R&D activities with our company's innovation focus. At SingularLogic, as a software integrator, we have identified data spaces and artificial intelligence (AI) as the top technological trends to concentrate on for the next few years, and we have set the fundamentals to synchronize and contribute to the relevant research communities. Acknowledging the need for sustainable and socially innovative ICT solutions, we focus on verticals such as energy efficiency, agriculture, and smart, resilient cities.

2023

2023 closes with ten active R&D projects contributing to energy efficiency and buildings, agriculture, cybersecurity and resilience, and real-time applications. Our contributions to the 2023 projects included the development of research prototypes and applications in these areas, along with significant dissemination and communication activities in flagship EU events, such as the European Big Data Value Forum and the Smart Cities Expo World Congress. In addition, as part of our activities in industry-academia networks, we host 2 PhD students and visiting researchers of various levels, working on research topics relevant to semantics technologies, cyber resilience, and time-critical applications.

2024

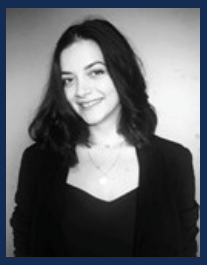
For 2024, a significant goal is to materialize our work toward setting up an open data exchange platform adhering to data space principles that will facilitate data analysis through vertical-specific AI models, providing new opportunities to transfer knowledge and innovation of new services within our group of companies and with academia and other researchers. In line with our strategic goals, we aim to continue and intensify our dissemination and communication activities by participating and actively contributing to our project results in important data, AI, climatic resilience, and sustainable development events.

The R&D and Innovation Team

Dr. Stamatia Rizou
RnD Manager

George Lagogiannis
Innovation & R&D
Senior Executive

Dr. Nikos Nikoloudakis
Project Manager



Antonia Vronti
Junior Project Manager

Iasonas Sotiropoulos
Software Engineer

Moatasim Mahmoud
Software Engineer
PhD Candidate

Mandeep Singh
Software Engineer
PhD Candidate

Athanasios Papanikolaou
Junior Software Engineer

Integrated Special Projects Team

Kostas Karavassilis, Senior Business Analyst
Aristeidis Poulas, Team Leader Portals & e-Commerce
Kostantinos Psychias, Team Leader Angular Technologies
George Kalogerakos, Software Engineer
Dimitra Sakellari, Software Engineer
Sofia Markaki, Software Engineer
Alexis Pavlopoulos, Junior Software Engineer

Projects' Progress

Building & Energy Efficiency

Agriculture

Cybersecurity & Resilience

Real-time apps

Projects' Progress

Building & Energy Efficiency | Agriculture | Cybersecurity & Resilience | Real-time apps

INHERIT

Next Generation Solutions for Sustainable, Inclusive, Resource-efficient and Resilient Cultural Heritage

10/2023 - 03/2027 | € 4.999.937 | www.inheritproject.eu

The INHERIT project aims to co-design, develop, demonstrate, validate, and replicate next-generation solutions for sustainable, inclusive, resource-efficient, and resilient cultural heritage buildings. SingularLogic is proudly coordinating the project that started on October 1st, 2023. During this short period that the project is running, we have hosted the INHERIT Kick-off meeting on our premises and set up the necessary communication channels and administrative processes. In the scientific part, our work in this initial period of the project is to lead the co-design of the ICT-based services that will be implemented in the context of the INHERIT project and to work on a data-space compliant data exchange platform tailored to the cultural heritage sector.

BUILDSPACE

Enabling Innovative Space-driven Services for Energy Efficient Buildings andClimate Resilient Cities

02/2023 - 01/2026 | € 2.632.367 | www.buildspaceproject.eu

BUILDSPACE is a project that enables innovative space-driven services for energy-efficient buildings and climate-resilient cities. During the first year of the project, SingularLogic has designed and implemented a prototype of the BUILDSPACE core platform that enables access to heterogeneous data, including terrestrial data from buildings, aerial imaging from drones equipped with thermal cameras, and location-annotated data from satellite services. The platform integrates identity management and storage components. It exposes a RESTful API that serves as a crucial intermediary for all services within the BUILDSPACE ecosystem, providing a standardized interface for data retrieval and manipulation. The ongoing work of SingularLogic attempts to integrate three Copernicus APIs related to the land, climate change, and Atmosphere services. Beyond the technical contributions, SingularLogic, as the exploitation manager of the project, led the creation of the first release of the project exploitation plans.

SRI-ENACT

Co-creating Tools and Services for Smart Readiness Indicator Uptake

12/2022 - 05/2025 | € 1.992.708 | www.srienact.eu

SRI-ENACT provides a holistic solution to facilitate the Smart Readiness Indicator (SRI) uptake in Europe by engaging stakeholders in the co-creation of national-tailored SRI implementations and the development of the SRI-ENACT toolkit, encompassing SRI assessment and decision support tools to promote informed decision making for smartness upgrades. In 2023, we developed the first SRI assessment tool release, which will be used for the pilot activities. Another important highlight has been the organization of the first co-creation workshop for the Smart Readiness Indicator in Athens, where we engaged key stakeholders in a round table discussion to establish the SRI in Greece.

Projects' Progress

Building & Energy Efficiency | Agriculture | Cybersecurity & Resilience | Real-time apps

AGRIDATAVALUE

Smart Farm and Agri-environmental Big Data Space

02/2023 - 01/2029 | € 7.145.500 | www.agridatavalue.eu

AgriDataValue aims to become the game changer in Smart Farming digital transformation and agri -environmental monitoring. During the past year, SingularLogic has contributed to the technical architecture design and followed the activities on use case design and user requirements elicitation. This work paves the way for the next stage of the implementation, where SingularLogic will implement a data storage solution and will integrate the "Drones Data Toolbox" to enable the ingestion of aerial imagery captured by multispectral cameras on drones to the emerging agri-data spaces. In addition to the technical contributions to the project, SingularLogic is leading the monitoring of the Digital Transformation landscape in Agriculture as part of the project's impact-creation activities.

ENTRUST

Next Generation of Trustworthy Agri-Data Management

01/2023 - 12/2026 | € 2.705.392 | www.entrustdn.eu

EnTrust is a doctoral network that aims to enable doctoral candidates to excel in their future careers and obtain a Ph.D. in the intersection between computing, information systems, and social science in the agri-data domain. Within ENTRUST, SingularLogic will host two doctoral candidates working on topics related to trustworthy data exchange and data monetization aspects, enabling viable business models for the agricultural sector.

ATLANTIS

Improved resilience of Critical Infrastructures AgainsT LArge scale transNational and sysTemic rISks

10/2022 - 09/2025 | € 9.998.535 | www.atlantis-horizon.eu

ATLANTIS aims to enhance resilience and cyber-physical-human (CPH) security of the key EU critical infrastructures by addressing resilience at the systemic level against major natural hazards and complex attacks that could potentially disrupt vital functions of society. During the project's first year, SingularLogic led the design of a traceable communications framework for Critical Infrastructures based on inter-DLT technologies. In addition, SingularLogic participated in the design of the use cases for the cross-domain large-scale pilot in health, logistics/supply chain, and border control.

EMPOWER

Uptake of new generation AI Powered Investigative tools for LEAs

05/2023 - 04/2026 | € 1.431.796 | www.transgero.eu/empower

The overall goal of the EMPOWER project is to foster the uptake of innovative solutions based on AI-powered tools, allowing LEAs to increase their capabilities in such investigative fields. During the project's first year, we worked on the initial technical design of the EMPOWER toolkit and the analysis of the technical specifications of the EMPOWER tools.

Projects' Progress

Building & Energy Efficiency | Agriculture | Cybersecurity & Resilience | Real-time apps

RESPECT

Secure and Privacy-preserving Indoor Robotics for Healthcare Environments

05/2021 - 04/2024 | € 1.094.800 | www.project-respect.eu

The objectives of the RESPECT project are the design and development of concrete defense strategies to ensure secure, safe, resilient, and privacy-preserving operation of indoor mobile robotics solutions for logistics applications in healthcare environments. In the past year, we have worked on the analysis of various attack models in multi-robot fleets in a simulation environment, utilizing the MQTT protocol.

MOTOR5G

MObility and Training fOR beyond 5G Ecosystems

11/2019 - 01/2025 | € 3.979.000 | www.motor5g.eu

MOTOR5G is an innovative training network for beyond 5G ecosystems. SingularLogic hosts an early-stage researcher focusing on 360° video streaming. Throughout the past year, our work on the MOTOR5G project has marked substantial progress, leading to multiple significant achievements. After solidifying the theoretical background by conducting a survey paper and a review paper on 360° video streaming, we performed an experimental evaluation to study and compare the performance of video compression tools when applied to tiled 360° videos. We achieved notable milestones in adaptive 360° video streaming by proposing and simulating novel optimization methodologies for enhancing the user experience of virtual reality (VR) applications in resource-limited networks. This year, our work within the MOTOR5G project has led to the publication of three scientific papers in accredited conferences and journals, and another two conference papers have been submitted and are currently under review. This year's advancements have met our planned schedule, showcasing pivotal accomplishments within the project. As we move forward, we will leverage this momentum to expand our work into new aspects and scenarios of 360° video transmission.

RECOMBINE

Research Collaboration and Mobility for Beyond 5G Future Wireless Networks

01/2020 - 06/2025 | € 478.400 | www.recombine-project.eu

RECOMBINE is a staff exchange program for future wireless networks and beyond 5G technologies. During 2023, SingularLogic contributed to the project by analyzing different Quality of Experience (QoE)models for 5G-enabled applications, focusing mainly on video streaming applications.

Insights

SRI-ENACT web application

Long-term strategies for smartness upgrades in building construction and renovation require reliable measures for assessing buildings' smart readiness. In this line, the Smart Readiness Indicator (SRI) was introduced in the revised EPBD to provide a standardized methodology for evaluating the smart readiness of buildings. In this context, the SRI assessment package was published, which provides a systematic methodology to assist facility managers and energy auditors in calculating the SRI considering specificities concerning the climatic zone and building complexity. The proposed reference methodology is a starting point for the uptake of the SRI in Europe.

SingularLogic worked on a tool to digitalize the SRI assessment process to provide a reliable, user-friendly digital tool assisting SRI assessments while providing assessment data access to multiple stakeholders. As part of our participation in the SRI-ENACT project, we have implemented a user-friendly web-based application enabling the SRI assessment of buildings. Following the SRI methodology, the application allows two modes of SRI assessment, the self-assessment by residents or the formal assessments by SRI auditors.

The SRI-ENACT assessment tool is available at https://www.srienact-tool.eu/

The application is open for residents's self registration. At the same time, it needs pre-registration for auditors through the pilot lead to ensure that only auditors who have followed appropriate training can be registered under this role in the application.

The tool will be used to support the large-scale pilot activities of the project, which include more than 100 SRI auditors in 8 EU countries to assess a total of more than 1,200 assessments. In the next period, the application will be extended to provide statistics and insights to multiple stakeholders in the so-called national SRI stakeholder forums created in the context of the project's stakeholder engagement activities.

Kostas Karavasilis
Senior Business Analyst , at SingularLogic

Data Interoperability through Semantic Web technologies and Natural Language Processing

Internet of Things (IoT) data can be utilized in many domain-specific applications to enable smart sensing in areas not initially covered during the conceptualization phase of these applications.

Data collected in IoT scenarios typically serve a specific purpose and follow heterogeneous data models and domain-specific ontologies. Therefore, IoT data could not easily be integrated into domain-specific applications, as it requires ontology alignment of diverse data models with the end application. This poses a big challenge to semantic interoperability during the integration of IoT data into a pre-established system.

In this line, the alignment process is cumbersome and challenging for an ontology engineer since it requires a manual review of the relevant ontologies that could be aligned with the IoT data. Additionally, before aligning each term used in the IoT data with the concepts defined in the domain-specific ontologies, all similar/related terms in the given ontologies must be considered.

As a response to this challenge, we worked on an approach that relies on the so-called Semantic Similarity Scoring Ontology (S3O), which automatically identifies the pairs of potential synonymous terms between a given IoT data and existing ontologies and standards and stores their similarity scores to make them available for future reference and reuse. Our approach is expected to significantly improve the efficiency of the cumbersome IoT data alignment process, providing a framework that could be extended to incorporate several ontologies, standards, and similarity score algorithms.

Our solution utilizes semantic web technologies and Natural Language Processing (NLP) and proposes an NLP-based term alignment with a similarity score that supports identifying the relevant terms used in IoT data and ontologies and stores the similarity scores among terms based on different similarity algorithms. We have showcased our solution by aligning IoT sensor data with the water and IoT domain ontologies.

Mandeep Singh
Software Engineer at SingularLogic
PhD Candidate

Find more about the research in the Publications Page at [4]

MOTOR5G Adaptive 360° Video Streaming

360° videos and virtual reality (VR) applications have gained notable popularity among the evolving multimedia technologies across various domains. The huge bandwidth requirements associated with 360° videos necessitate the development of efficient streaming solutions designed to enhance the user's quality of experience (QoE). In the context of the MOTOR5G project, we have investigated the tile quality selection problem in multi-quality tiled 360° video streaming. We proposed a tile quality assignment scheme that maximizes the user's viewport quality in bandwidth-constrained 360° video streaming.

We first formulated the problem as an optimization problem and put forward a greedy algorithm. Our method prioritizes tiles with a higher impact on the delivered viewport quality by incorporating the tiles' viewing ratios in the decision-making. The simulation results confirmed the benefits of enhancing the viewport quality by prioritizing fully watched tiles. Moreover, we performed viewport estimation using a recurrent neural network to test our technique more practically. The effect of a viewport margin was also considered in the latter evaluation.

As an extension of this work, we have performed a comparative analysis of viewing port prediction methods. We formally introduced the problem of viewing direction prediction, and we analyzed the viewing behavior based on a rich, large-scale public dataset. To tackle the viewing prediction problem, we compared four different regression models. In addition, we developed two binary classification models that directly predict which tiles are watched by the users and compare their performance to the regression based solutions. Our evaluation results show that all four regression models achieve comparable performance. However, the results also show that classification models are more appropriate for tile-based streaming settings.

Moatasim Mahmoud
Software Engineer at SingularLogic
PhD Candidate

Find more about the research and experiments in the Publications Page at [1] [2] [3].

RESPECT
Analysis of resilience in multi-robot environments

In the era of autonomous robotics, multi-robot fleets have emerged as a cornerstone of technological advancement, demonstrating their prowess in a multitude of applications ranging from disaster response to environmental monitoring. These fleets, composed of diverse robotic agents working collaboratively, promise to revolutionize industries and provide innovative solutions to complex real-world challenges.

As part of the RESPECT project, we analyzed the resilience of a multi-robot fleet in a healthcare environment. We aimed to explore whether such a fleet retains its effective operation after cyber security threats have compromised it. We first carried out a thorough literature review of state-of-the-art methods and technologies to achieve resilience. Subsequently, we listed various modern attack vectors that can target a simulated floor environment provided by one of the project partners.

We focused on attack vectors targeting the communication aspect of a robotic fleet, in our case, the MQTT protocol. We then developed several cyber-attack scenarios to be executed in a testing simulation environment and monitored the system's response. We used two main groups of attacks: man-in-the-middle (MitM) attacks and a more centralized denial of service (DoS) attack category. Specifically, we used MitM attacks to spoof a connection between a single robot and the central communication broker of our fleet. This way, we intercepted messages and sent malicious ones instead, which caused robotic failure. We concluded that despite robotic failure, our system could successfully respond to such a threat by reallocating its resources.

On the other hand, DoS attacks proved significantly more destructive, in some cases rendering the system completely unresponsive. Such attacks were aimed directly at the broker, aiming to exhaust its resources, and while some DoS attacks proved more effective than others, in all cases, we noted considerable damage.

The results of this work will be published in 2024.

Athos Papanikolaou
Junior Software Engineer, at SingularLogic

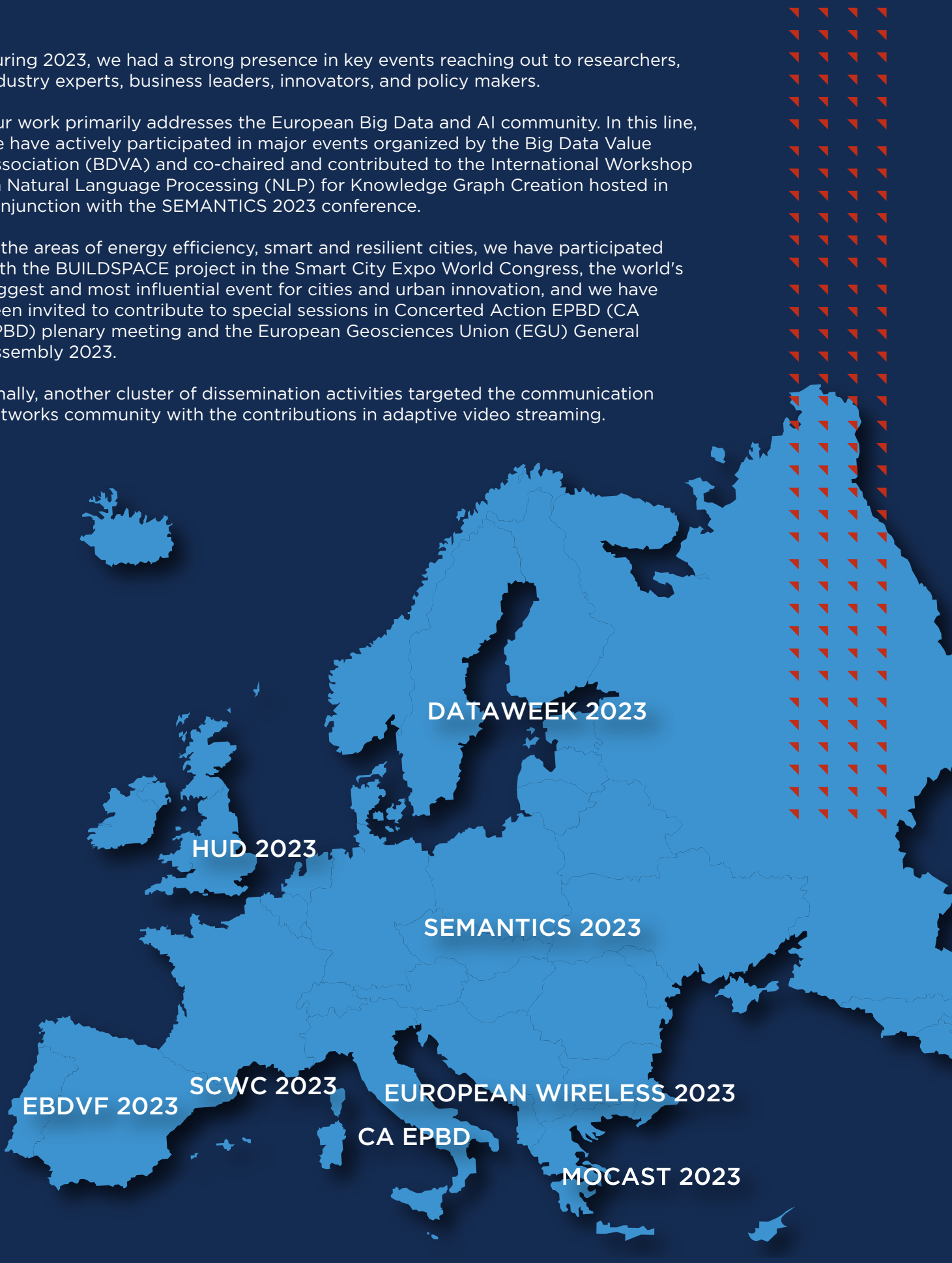
Dissemination

During 2023, we had a strong presence in key events reaching out to researchers, industry experts, business leaders, innovators, and policy makers.

Our work primarily addresses the European Big Data and AI community. In this line, we have actively participated in major events organized by the Big Data Value Association (BDVA) and co-chaired and contributed to the International Workshop on Natural Language Processing (NLP) for Knowledge Graph Creation hosted in conjunction with the SEMANTICS 2023 conference.

In the areas of energy efficiency, smart and resilient cities, we have participated with the BUILDSPACE project in the Smart City Expo World Congress, the world's biggest and most influential event for cities and urban innovation, and we have been invited to contribute to special sessions in Concerted Action EPBD (CA EPBD) plenary meeting and the European Geosciences Union (EGU) General Assembly 2023.

Finally, another cluster of dissemination activities targeted the communication networks community with the contributions in adaptive video streaming.



BIG DATA & AI

DataWeek 2023, Luleå, Sweden

The DataWeek 2023 is the spring gathering of the European Big Data and Data-Driven AI research and innovation communities. It is a yearly event that brings together experts, innovators, and enthusiasts from various domains to explore the vast realm of data and its transformative potential.

During DataWeek 2023, our manager Dr. Stamatia Rizou organized the special session "Leveraging Earth Observation Data to support energy efficiency and the European Green Deal", which focused on earth observation and data technologies and applications and welcomed the BUILDSPACE project alongside three other presentations: "Harmonizing EO and non-EO data-based on Linked Data principles ", "Paving the way for the Green Deal Data Space: the GREAT project", and "Climate- resilient regions through systemic solutions and innovations: The Athens case study".

Following the presentations, an open discussion allowed presenters to delve into important topics, such as the role of Linked Data Principles in democratizing Earth Observation data, the significance of Earth Observation in the Green Deal data space, and the challenges of merging Earth Observation data with other data types, including citizen science and public administration data.

European Big Data Value Forum, Valencia, Spain

The European Big Data Value Forum is the flagship event of the European Big Data Value and Data-Driven AI Research and Innovation community.

SingularLogic has participated with a booth at the exhibition as a gold sponsor in the European Big Data Value Forum 2023 (EBDVF 2023) on the 25th to 27th of October in Valencia, Spain. We welcomed the event guests in our booth at Feria Valencia (3rd Floor). We took the opportunity to discuss the activities of SingularLogic and SPACE Hellas in the areas of trustworthy data exchange and governance, as well as AI-enabled applications.

SEMANTICS 2023, Leipzig, Germany

Mandeep Singh, researcher at SingularLogic, presented the paper titled: "Towards aligning IoT data with domain-specific ontologies through Semantic Web technologies and NLP" in the 2nd International Workshop on Natural Language Processing (NLP) for Knowledge Graph Creation hosted in conjunction with SEMANTICS 2023, on September 20th in Leipzig.

The publication is part of the industrial PhD work co-supervised by SingularLogic and Birmingham City University.

ENERGY EFFICIENCY, SMART CITIES, RESILIENCE

Smart City Expo World Congress, Barcelona, Spain

Smart City Expo World Congress is the world's biggest and most influential event for cities and urban innovation. The mission of SCEWC is to accelerate a brighter urban paradigm towards green, efficient, and thriving cities that leave no one behind.

SingularLogic represented the BUILDSPACE project at the joint stand of 30+ EU projects, DGs, and initiatives, collectively presented under the banner of "EC Initiatives on Climate-Neutral and Smart Cities" at this year's Smart City World Expo Congress in Barcelona, 7 - 9 November 2023.

Our Stamatia Rizou moderated the BUILDSPACE booth session on November 7th, and together with esteemed colleagues from Space Hellas, SenseOne, and our partners from UPM, we discussed how digital solutions can help make the urban future sustainable and climate resilient.

Informal Session, CA EPBD Plenary, Rome, Italy

BUILDSPACE project was presented by Dr. Stamatia Rizou, R&D Manager at SingularLogic, in the informal session "Copernicus for Energy Efficiency in buildings", organized by EUSPA, during the Concerted Action EPBD (CA EPBD) plenary meeting on April 19th, 2023 in Rome.

The Concerted Action EPBD addresses the Energy Performance of Buildings Directive (EPBD), and it involves representatives of national ministries or their affiliated institutions in each EU Member State, plus Norway. The presentation at the informal session emphasized the core concepts and objectives of the project. The project's presence acknowledged its potential to reshape the building and urban sector. The project's innovative approach and collaborative efforts have garnered attention and sparked engaging discussions among experts and stakeholders.

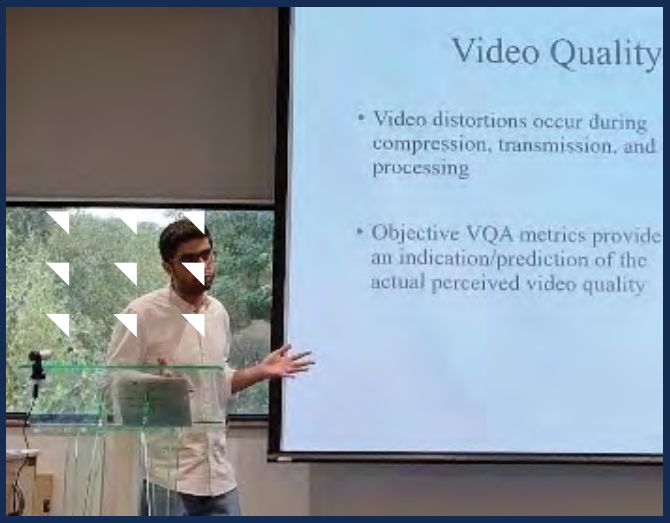
EGU General Assembly 2023, Online Participation

The European Geosciences Union (EGU) General Assembly 2023 brings together geoscientists from all over the world to one meeting covering all Earth, planetary, and space sciences disciplines. The EGU aims to provide a forum where scientists can present their work and discuss their ideas with experts in all fields of geoscience. On April 24th, 2023, Dr. Stamatia Rizou presented the objectives, key concepts, and use cases of the BUILDSPACE project in the special session: "From HPC to Cloud and Edge Computing in Earth Observation and Earth Modelling", co-chaired by our partner Dr. Vasileios Baousis from ECMWF.

VIDEO STREAMING AND REAL-TIME APPLICATIONS

International Conference on Modern Circuits and Systems Technologies (MOCAST) Athens, Greece

Our colleague Moatasim Mahmoud, Software Engineer and PhD candidate, presented the paper "A review of Deep Learning Solutions in 360° Video Streaming" on June 27th at the International Conference on Modern Circuits and Systems Technologies (MOCAST) in Athens.



European Wireless 2023 Conference Rome, Italy

Our Moatasim Mahmoud, Software Engineer and PhD candidate, presented the paper titled "Versatile Video Coding Performance Evaluation for Tiled 360° Videos" at the European Wireless 2023 Conference in Rome, Italy, 02-04 October 2023.

University of Huddersfield, Huddersfield, UK

Moatasim also had a speach at The University of Huddersfield, in 26-27 September 2023, as part of the of the MOTOR5G workshop, about emerging technologies and research in 6G and Satellite Communications.

MEETINGS ORGANIZATION

Kick-off meetings, Athens, Greece

During 2023, we hosted two Kick-off meetings for the BUILDSPACE and INHERIT projects. SingularLogic and Space Hellas organized the BUILDSPACE kick-off meeting, which took place on 6-7 February 2023 at Space Hellas headquarters in Athens, Greece. The INHERIT Kick-off meeting occurred on 2-3 November 2023, at SingularLogic headquarters.

SRI Co-creation Workshop, Athens, Greece

As part of stakeholder engagement activities in the SRI-ENACT project, together with DSS Lab, EPU-NTUA organized the first co-creation workshop about the Smart Readiness Indicator in Athens. The workshop gathered stakeholders, including energy experts, researchers, and policy makers, who interacted and exchanged their expertise and know-how on the future of the Smart Readiness Indicator in Greece.

2023 Publications

[1]

M. Mahmoud et al., "A Review of Deep Learning Solutions in 360° Video Streaming," 2023 12th International Conference on Modern Circuits and Systems Technologies (MOCAST), Athens, Greece, 2023, pp. 1-4, doi: 10.1109/MOCAST57943.2023.10176729.

[2]

M. Mahmoud et al., "A Survey on Optimizing Mobile Delivery of 360° Videos: Edge Caching and Multicasting," in IEEE Access, vol. 11, pp. 68925- 68942, 2023, doi: 10.1109/ACCESS.2023.3292335.

[3]

M. Mahmoud et al., "Versatile Video Coding Performance Evaluation for Tiled 360° Videos", European Wireless Conference 2023, Rome, Italy, October 2-4, 2023

[4]

Singh, Mandeep and Vakaj, Edlira and Rizou, Stamatia and Wu, Wenyan (2023) "Towards aligning IoT data with domain-specific ontologies through Semantic Web technologies and NLP". In: SEMANTICS 2023 EU, 19th international conference on Semantic system 2023 20-22 September, 2, Leipzig, Germany.

Projects 2024

Building & Energy Efficiency | Agriculture | Cybersecurity & Resilience | Real-time apps

POWERYOUTH

Empowering youth for energy community actions

01/01/2024 - 31/12/2026 € 1.499.997

POWERYOUTH aims to empower young people to play an active role towards the energy transition. The cornerstone of the POWERYOUTH concept is a participatory approach that establishes a dialogue between youth and local stakeholders (such as local authorities, policy makers) and empowers young people in actively participating in energy communities. POWERYOUTH will develop appropriate tools and methods to facilitate the three stages, by delivering a participatory democracy platform to allow young people voicing their opinions ('PARTICIPATE' tool), a tool to support collective decision making ('DECISION' tool) and a tool for promoting innovative business models and financing schemes ('FINANCE' tool).

The POWERYOUTH approach will be implemented in pilots in 5 EU countries, targeting the creation of at least 10 empowered youth energy communities and the involvement of at least 1,000 young people and other stakeholders. In addition, with the support of EU-wide networks of local and youth communities, POWERYOUTH will create and deliver a capacity building programme to create a cohort of Youth Energy Community Leaders that will act as multipliers towards the replication of POWERYOUTH approach across EU. SLG will coordinate the POWERYOUTH project and will be responsible for the POWERYOUTH toolkit and the business models for the youth energy communities. SLG will also contribute to the exploitation and sustainability of the action, as well as synergies with LIFE programmes, other EU projects and related initiatives.

6G-ICARUS

6G Intelligent Connectivity And inteRaction for Users and infraStructures

03/2024 - 02/2028 € 501.400

The 6GICARUS project will investigate, combine, and improve on current technologies in order to address numerous obstacles that 6G networks will face in order to define the future wireless networks (FWNs). 6G-ICARUS is founded on three pillars:

i. Effective utilisation of reconfigurable intelligent surfaces suitably controlled by artificial intelligence software;
ii. Channel modelling for mmWave/subTHz communications;
iii. Multi-connectivity solutions for 6G mobile communications.

The project will generate novel research results as well as novel original hardware supported by innovative software (techniques, algorithms) based mostly on machine learning and deep learning. SLG will work on Multi-Connectivity network architectures and resource management and will also lead dissemination and communication activities of the project.

2023
Annual Report

R&D and Innovation

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SingularLogic