

AERAS

NewsLetter #3



AERAS

A CybEr range tRaining platform for medicAl organisations and systems Security

AERAS Concept & Approach

AERAS aims to develop a realistic and rapidly adjustable cyber range platform for systems and organizations in the critical healthcare sector, to effectively prepare stakeholders with different types of responsibility and levels of expertise in defending high-risk, critical cyber-systems and organizations against advanced, known, and new cyberattacks, and reduce their security risks. The platform will be a virtual cyberwarfare solution enabling the simulation of the operation and effects of security controls and offering hands-on training on their development, assessment, use, and management.

PROJECT OBJECTIVES

Develop and deliver a highly adaptive and person-centric service to support older adults in work life by creating a positive work environment for employee wellbeing.

Develop smart environment technologies to improve occupational safety and health.

Enhance the perception and cognition of smart devices towards human-centered and intuitive human-computer interaction.

Develop and validate a solution in real-world environments, capitalizing on ICT innovations that will increase the competitiveness of EU industry by accommodating the ageing workforce.

Guarantee cost-effectiveness and create socio-economic benefits.



AERAS Consortium

The consortium consists of 9 partners from Academia and Industry from 4 EU countries (Italy, Greece, Cyprus, Germany):



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Università Degli Studi Di Milano (UMIL), Italy
The Coordinator

Hospital Environment Pilot (UPAT), Greece



Cyprus University of Technology (CUT), Cyprus

Panepistimiako Geniko Nosokomeio Irakleiou (PAGNI),
Greece



Aegis IT Research GMBH (AEGIS), Germany

SPHYNX Analytics Limited (SPHYNX), Cyprus



Ethical AI Novelties (EAIN), Cyprus

Trinomial Technologies (TRID), Cyprus



Libra AI Technologies (LIBRA), Cyprus



AERAS has received funding from the European Union's Horizon 2020 Research and Innovation program under Grant Agreement No 872735.



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Meet the AERAS new Partners

Trinomial Technologies (TRID)



Trinomial Technologies Ltd. is a leading research and development company established by a team of experienced engineers and researchers with a shared passion for innovation. Drawing on over a decade of expertise, Trinomial offers a comprehensive range of consulting services, leveraging the extensive knowledge of its founders and employees to deliver cutting-edge solutions.

With a proven track record, Trinomial has successfully completed and contributed to numerous projects across diverse fields, including healthcare, cybersecurity, fintech, real estate, telecommunication, defense, sports analytics, the Internet of Things, and digital competences for citizens. The company specializes in Big Data Analysis, Artificial Intelligence, Machine Learning, Cyber Security, Firmware Design and Research, as well as Web and Mobile Application Development.

By combining state-of-the-art research with innovative technologies, Trinomial creates competitive, tailor-made solutions that meet client needs while driving its researchers and organization toward new heights of excellence. With a steadfast vision to empower growth and innovation, Trinomial Technologies is proud to contribute its expertise to the AERAS EU Project."

Organization's Involvement in the AERAS Project: "Trinomial Technologies Ltd. plays a pivotal role in the AERAS project, contributing extensively to Work Package 5: Platform Integration, Pilots, and Validation. Within this work package, Trinomial leads Task 5.1: Integration of tools and components and testing of the integrated AERAS platform, focusing on the seamless integration and secure operation of the platform. This involves a phased integration process of core tools and components developed in WP3 and WP4, guided by the architecture defined in WP2. Trinomial is responsible for delivering the final prototype of the integrated AERAS platform, which will be evaluated through real-life scenarios in the healthcare domain.

Additionally, Trinomial is a key contributor to the project's security assurance and modeling activities, leading Task 3.2: CRSA-driven Cyber Range Program Development and Task 3.4: Hybrid Cyber Security Risk Analysis Models. These tasks enhance the project's cybersecurity framework by advancing innovative models and methodologies for cybersecurity training and risk analysis.

Strategically, Trinomial aims to leverage the AERAS platform and its outcomes to expand its offerings in the healthcare and cybersecurity sectors. This includes developing specialized training materials to optimize the platform's use and designing programs to enhance the skills of security auditors, end-users, and administrators of critical digital systems. By incorporating insights from AERAS, Trinomial is committed to improving its consultancy services, empowering customers to better understand and manage cybersecurity in their systems, and enriching its training resources for ongoing projects aimed at fostering digital competencies among the public."



For more info visit:
<https://trinomialtechnologies.eu>

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Libra AI Technologies
(LIBRA)



LIBRA is an AI-focused company with a highly skilled team led by Dr. Kopsinis Yiannis. LIBRA creates tailor-made solutions, such as customized interactive visual analytics and AI-powered dashboards, under the AI-as-a-service rationale. In addition, LIBRA owns high-end research facilities equipped with many workstations with high-end GPUs for DL R&I.

The platform as a service development expertise of LIBRA and their large portfolio of secure cloud software libraries ensure perfect hosting and successful implementation of the assigned seconded staff's foreseen engineering and integration tasks. This also ensures the effective transfer of knowledge and introduction of AI capabilities throughout AERAS technical WPs.

LIBRA will contribute to defining the training scenarios related to new and critical cybersecurity threats, working on defining CRSA and CRST model instances.

LIBRA will contribute to the definition and enforcement of risk analysis models based on the input received from the D4.2 AERAS Monitoring, Assessment and Adaptation mechanisms.



For more info visit:
<https://www.libramli.ai>

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Ethical AI Novelties (EAIN)



AI CYPRUS ETHICAL NOVELTIES LTD.

EAIN is dedicated to harnessing the AERAS platform to advance the symbiotic relationship between AI and cybersecurity. Our plan centers on fostering this synergy to enhance cybersecurity practices and develop cutting-edge AI-driven security solutions.

Our target audience includes (i) Cybersecurity Professionals: Offer AI-driven security solutions and training programs to enhance cybersecurity capabilities. (ii) Academic and Research Community: Collaborate on research projects and knowledge sharing in the realm of AI-powered cybersecurity. (iii) Government and Regulatory Bodies: Provide insights and solutions to bolster national and international cybersecurity standards.

Our plan entails a mess of intertwined strategies and actions, including (i) Solutions Building: Develop state-of-the-art AI-powered security tools and services that can be integrated into existing cybersecurity infrastructure. Offer customized security services to meet the specific needs of organizations. (ii) Research Collaboration: Collaborate with leading academic institutions to conduct research at the intersection of AI and cybersecurity. Focus on AI-driven threat intelligence, anomaly detection, and predictive analysis. Publish research findings in top-tier cybersecurity conferences and journals. (iii) Educational Initiatives: Develop training programs that leverage AI for cybersecurity professionals. Provide workshops and seminars on the integration of AI in cybersecurity practices. Partner with local universities to create AI-enhanced cybersecurity curricula. (iv) Policy and Standards Influence: Engage with government agencies and regulatory bodies to shape AI-driven cybersecurity policies. Advocate for the inclusion of AI-based security standards in national and international cybersecurity frameworks. Participate in cybersecurity policy discussions and contribute expertise

EAIN is a Leader of WP3 - AERAS Models & Model-driven Cyber Range programmes creation.



For more info visit:
<https://ethicalaicy.com>

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Meet the AERAS Secondees

Fulvio Frati



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My name is Fulvio Frati and I graduated in 2004 in Computer Science at the Computer Science Department of the University of Milan (Italy), where I'm currently working as part of the admin staff and member of the SESAR Lab. My research history started many years ago participating in several FP7 and Horizon2020 projects. In particular, in two of them, ARISTOTELE and THREAT-ARREST, I was mainly involved in the design and implementation of collaborative and teaching environments aimed at raising the involvement of participants fostering interactions between them, trying to provide users with the most valuable resources for the training. AERAS for me is the opportunity to capitalize what I learned and what I have done in my research activity. From the first days, together with the project coordinator Prof. Ernesto Damiani, I was part of the coordinating team design and kicking off the first user requirements analysis.



My two secondment periods at Sphynx Analytics, based in Nicosia in the sunny Cyprus, and AEGIS in Braunschweig, in the middle of the Lower Saxony, has been the unique opportunity to meet interesting research mates, share our knowledges and have a great time. I will never forget the time spent in Cyprus discussing on how we can integrate modern cyber ranges infrastructures with assurance platforms, and the fruitful interactions with the AEGIS team on how these concepts and tools can be proposed and supplied to trainees in a friendly and at the same time productive way. While in Cyprus, I had also the opportunity to catch up with the CUT's team and exchange our points of view on how the training activities should be organized in such a complex system. By the way, not only of research a man can live... as a hiking fanatic I used all my free time to explore those two different environments. From the ancient history and gold beaches of Cyprus, to the outstanding cities and the great past of Lower Saxony you can still feel in their castles and palaces.

To summarize, the great adventure I had thanks to my participation in AERAS was important to raise my knowledge and awareness in cybersecurity training and related tools, and the exchange with different research teams had the paramount result of opening up my mind and level up my collaboration skills at a new level.



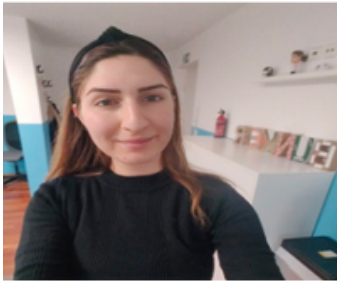
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Meet the AERAS Secondees



Pantelitsa Leonidou



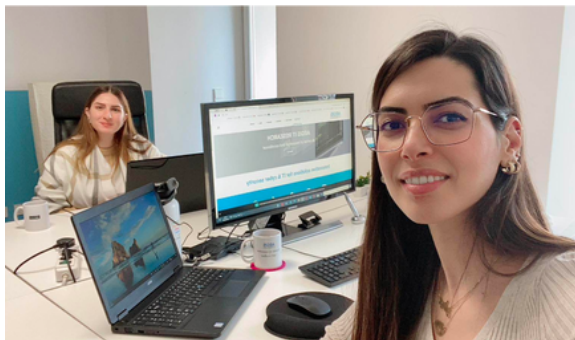
I am Pantelitsa Leonidou, a Special Scientist/Researcher at the Social Computing Research Center and a PhD student at the Cyprus University of Technology. Since joining in 2020, my research has focused on cybersecurity, specifically enhancing user safety on social media by addressing issues like misinformation and abusive content. I hold a BSc in Computer Science and an MSc in Data Science and Engineering.

In 2020, I joined the AERAS project and had the opportunity to work directly with AEGIS IT in Braunschweig, Germany, for 12 months. This secondment was a significant experience that exposed me to new technologies and methodologies and deepened my practical understanding of cybersecurity.

I worked closely with AEGIS during my secondment to create model-driven Cyber Range training programs. This included defining Cyber Range Security Assurance (CRSA) models, conducting threat analyses, and establishing security assurance profiles specific to healthcare, which laid the groundwork for more focused CRST programs. My work extended to evaluating open-source technologies like QEMU and Docker for AERAS's emulation and visualization components. I defined requirements for healthcare system simulation and contributed to making visualization tools more intuitive, especially for non-technical users.

AEGIS shared their extensive experience in Cyber Range training, model languages, and visualization technologies. Their approach to user-friendly environments in CRST programs was especially valuable for my work in developing intuitive tools for all users. I contributed insights on Federated Learning applications in healthcare and initiated work on [a paper discussing its applications in online content moderation](#). This publication acknowledges the support of the AERAS project. Additionally, I shared findings from healthcare threat analyses and contributed to ideas for front-end usability in visualization tools.

The year in Braunschweig also allowed me to experience Germany's culture, explore beautiful areas around Braunschweig, and gain a unique perspective on living abroad. Adapting to new environments, both professionally and personally, enriched my overall experience and broadened my understanding of collaborative research on an international scale.



Find out more about
Pantelitsa
on [LinkedIn!](#)



Meet the AERAS Secondees



Nikos Salamanos

I am Nikos Salamanos, a Postdoctoral researcher at the Social Computing Research Center at the Cyprus University of Technology. For the last six years, I have been involved in several EU-funded research projects. Within the framework of these projects, I worked on developing privacy-preserving content moderation tools for social media, detecting disinformation on Twitter using state-of-the-art machine-learning techniques and conducting empirical studies of disinformation events. This included analyzing very large datasets using graph-theoretic tools. My research interests include distributed machine learning and data-driven studies of collective and dynamic behavior in social networks, such as the diffusion of disinformation and the quantification of social influence. I received my PhD in Computer Science from the Athens University of Economics and Business. My background is interdisciplinary, spanning Physics (B.Sc.), theoretical computer science (M.Sc.), and social network analysis (PhD).

I joined the AERAS project in 2022 and had the opportunity to work with Panepistimiako Geniko Nosokomeio Irakleiou (PAGNI) for the whole year. I contributed to WP3 "AERAS Models & Model-driven Cyber Range Programmes Creation," focusing on the specification of Cyber Range Security Assurance (CRSA) models and CRSA-driven Cyber Range Simulation and Training (CRST) programs tailored for healthcare pilot use cases. This involved conducting a threat analysis for the healthcare sector, defining cyber range requirements, and analyzing the PAGNI infrastructure and its three key e-services: the Surgery List for managing scheduled and emergency surgeries, e-Rantevou for online appointment reservations, and e-Apotelesmata for accessing lab results and medical imaging archives. Additionally, as part of the online survey (organized by CUT & PAGNI), we evaluated the general state of cybersecurity in the healthcare sector in order to identify the requirements for developing a cybersecurity training platform.

In 2023, research was conducted on privacy-preserving federated learning centered on detecting harmful content on Twitter. This effort led to a publication at an international conference (<https://doi.org/10.1145/3543873.3587604>). Finally, in 2024, I served as the lead editor on the D4.1 "AERAS Cyber Range Tools," which details the initial specification and implementation of the AERAS Cyber Range and simulation tools, as well as the visualization components.



Find out more about
Nikos [here!](#)

AERAS partners have submitted the following deliverables:

- ✓ D3.1 CRSA Models and CRSA-driven Cyber Range programme specification language - May 2024
- ✓ D4.1 AERAS Cyber Range Tools - V1 - Aug 2024
- ✓ D4.2 AERAS Monitoring, Assessment and Adaptation mechanisms - V1 - May 2024
- ✓ D5.1 Initial Prototype of integrated AERAS platform - Aug 2024
- ✓ D5.2 AERAS Evaluation Framework and Pilot Set Up Guidelines - Aug 2024

The deliverables will appear on the AERAS website at the following link:
<https://www.aeras-project.eu/deliverables/>



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