

MARIOS VARDALACHAKIS

Software Engineer

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mariosvard

SUMMARY

I design, deploy, and maintain privacy-enhanced AI systems operating in a highly regulated production environment. My expertise lies in architecting secure and scalable ML infrastructures, including the integration of privacy-enhancing technologies and data governance frameworks into operational platforms. I deliver end-to-end AI systems that ensure data integrity, transparency, and regulatory compliance across the ML lifecycle from model development and validation to deployment, monitoring, and continuous optimization. I build robust infrastructures capable of supporting scalable ML workloads within secure data ecosystems. As a participant in Horizon Europe initiatives, I contributed to the development and deployment of compliance-oriented AI systems operating in a structured environment of governance and regulatory frameworks. My primary focus is the operationalization of scalable ML infrastructures that embed privacy by design principles to facilitate the deployment of responsible AI systems at scale.

SKILLS

- **Programming Languages:** Python, Javascript, R
- **Frontend Technologies:** HTML5, CSS3, Bootstrap, Shiny, Django, D3.js, DC.js
- **Backend & Web Frameworks:** Django, FastAPI, Shiny, WordPress, RESTful API Design
- **Databases:** PostgreSQL, MySQL
- **DevOps & Deployment:** Docker (Foundational Level), CI/CD (GitHub Actions), Swagger / OpenAPI, Basic monitoring
- **Data Science & Analytics:** Pandas, NumPy, Matplotlib, Plotly, Power BI, ETL Pipelines
- **Machine Learning & GenAI:** Scikit-learn, TensorFlow, Pytorch, Model Optimization, Evaluation Pipelines, Prompt Engineering, LLM Integration
- **Security & Privacy:** Secure coding practices, privacy-by-design, k-anonymity, l-diversity, differential privacy, federated learning, Secure Multi-Party Computation (SMPC)
- **Tools & Platforms:** Git, GitHub, Jupiter, VS Code, IntelliJ IDEA, LaTeX, Kali Linux
- **Research Skills:** Academic writing, literature review, experimental design, Conference Presentations, Publication Writing

PROJECTS

Technology	InvisseeAi: Advanced HealthCare Anonymization Platform (Deployed and functional with ongoing enhancements) R, Shiny, PostgreSQL, Plotly An advanced healthcare data privacy tool that protects patient confidentiality while preserving data utility. The tool integrates state-of-the-art privacy techniques like k-anonymity, l-diversity, t-closeness, differential privacy, secure multiparty computation (SMPC), and federated learning—enabling secure, privacy-aware research collaboration in healthcare environments. Github
Technology	ShinyAnonymizer R, Shiny, PostgreSQL, Plotly A Tool for Anonymizing Health Data: A tool enabling non-expert users to use and combine state-of-the-art privacy models for the protection of Data Github
Technology	IoT Malware Dashboard HTML, CSS, JS, D3.js, Dc.js, Crossfilter.js A fully interactive dashboard for exploring IoT malware incidents, trends, and statistics in real time. Github
Technology	Cybercrime Complaints & Losses Dashboard <i>HTML, CSS, JS, D3.js, Dc.js, Crossfilter.js</i> A fully interactive Cybercrime Complaints & Losses Dashboard for real-time data exploration Additional Projects: https://mariosvard.github.io/mariosvardalachakis/ Github

EDUCATION

2024-2026	M.Phil. by Research in Intelligent Systems(Fully Remote) Department of Cultural Technology and Communication, University of the Aegean GPA: 9.50/10 Mytilene, Greece
2020-2024	M.Sc. in Software Engineering(Fully Remote) Department of Electrical and Computer Engineering, Hellenic Mediterranean University GPA: 7.50/10 Heraklion, Crete, Greece
2011-2020	B.Sc. (Informatics Engineering) Department of Electrical and Computer Engineering, Hellenic Mediterranean University GPA: 6.30/10. Heraklion, Crete, Greece
2008-2009	P.SE Telecommunications Engineering Institute of Vocational Training (I.E.K.) Heraklion, Crete

EXPERIENCE

2024-2026
of the Aegean

Ai/ML Full Stack Engineer | M. Phil Researcher (Intelligent Systems) PRIVACT P.C. & PrivaSI Lab, Univ.

Project: InvisseeAI - Advanced Healthcare Data Anonymization Platform

 GitHub

Key Contributions

- Designed and implemented InvisseeAI as an end-to-end AI-driven platform for healthcare data anonymization and privacy-preserving analytics.
- Developed backend RESTful APIs (FastAPI/plumber) to expose anonymization workflows and AI pipelines as production-ready services.
- Built secure data processing pipelines aligned with GDPR, privacy-by-design, and data minimization principles.
- Integrated machine learning components (Scikit-learn, PyTorch) to evaluate utility loss and validation performance under anonymized data.
- Designed modular, layered software architecture following clean code principles for scalability and maintainability.
- Contributed to experimentation, testing, and technical validation in an R&D research environment.
- Supported EU Horizon Europe activities through deliverables and demonstrator development (SECURED project).

2022 - 2023

Office Worker

National Sports Center(EAKH), Heraklion, Greece

Key Contributions:

- Delivered first-line technical support for hardware and software issues, resolving routine IT incidents and supporting daily staff operations.
- Managed data entry and maintenance across spreadsheets, databases, and internal information systems, ensuring accuracy, completeness, and data integrity.
- Supported document lifecycle processes including preparation, formatting, scanning, archiving, and protocol management of official records.
- Coordinated internal and external communications via email and telephone, routing inquiries efficiently across departments.
- Assisted the Director’s Office in preparing reports, official correspondence, and presentation materials.
- Maintained organized digital and physical filing systems in compliance with public administration procedures.
- Provided front-desk support, handling visitor reception and responding to inquiries in a professional and structured manner.

2016-2018

R&D Engineer (Internship and BSc Thesis) Computational Biomedicine Laboratory (CBML) - ICS-FORTH

Project: ShinyAnonymizer: A tool For Anonymizing HealthCare Data

 GitHub

Key Contributions:

- Designed and developed ShinyAnonymizer, an interactive web platform for anonymizing sensitive healthcare datasets.
- Built dynamic Shiny dashboards enabling non-expert users to configure anonymization parameters and visualize results in real time.
- Integrated privacy-preserving techniques, including k-anonymity, hashing, and encryption methods for secure healthcare data processing.
- Implemented backend components and data access layers using PostgreSQL, improving consistency and performance.
- Translated research anonymization algorithms into a functional demonstrator within the Horizon 2020 iManageCancer ecosystem.
- Collaborated with a multidisciplinary research team, contributing to applied R&D workflows and project deliverables.

Research Projects & Funding

07/2025-12/2025 **InvisseeAI: Advanced Healthcare Data Anonymization Platform** (secured-project.eu)
SECURED Open Call Project - HORIZON-RIA
Grant Agreement No. 101095717

- Role: Project Lead/Core Developer
- Collaborations: PRIVACT P.C. & PrivaSI Lab, University of the Aegean

Project Overview

- InvisseeAI is an AI-driven platform for privacy-preserving healthcare data anonymization and secure analytics, developed within the Horizon Europe SECURED Open Call framework.

Strategic & Leadership Contribution

- Authored and submitted the successful funding proposal under the SECURED Open Call, leading to project approval and execution.
- Led the technical planning, architecture design, and development lifecycle of the project.

Technical Contribution

- Designed and implemented the full-stack architecture of the InvisseeAI platform, including backend services, privacy-preserving data processing pipelines, and secure data storage components.
- Developed modular anonymization workflows integrating k-anonymity, l-diversity, t-closeness, Differential Privacy, and Federated Learning techniques.
- Applied secure-by-design and GDPR-aligned engineering principles for handling sensitive healthcare datasets.

Outcome

- Research and system results published at IISA 2025.
- Platform delivered as part of Horizon Europe SECURED project activities.

11/2016 - 12/2018

ShinyAnonymizer: A Tool for Anonymizing Healthcare Data
IManageCancer Project - Horizon 2020

Role: Project Lead & Core Developer

Institution: Computational Biomedicine Laboratory (CBML), Institute of Computer Science (ICS-FORTH)

Project Overview

- ShinyAnonymizer is a web-based platform for anonymizing and managing sensitive healthcare datasets, developed within the Horizon 2020 iManageCancer project.

Technical Contribution

- Led the end-to-end design and implementation of a web-based anonymization and data management system.
- Transformed research-grade anonymization algorithms into deployable, production-ready software components.
- Designed interactive dashboards for dataset management, privacy parameter configuration, and visualization of anonymization metrics.
- Integrated anonymization, hashing, and encryption techniques within a PostgreSQL-backed architecture

Funding

- Horizon 2020 – iManageCancer Project
- Additional support from BOUNCE and MyPal initiatives

Outcome

- Platform and research results published at ICT4AWE 2019.
- Contributed to Horizon 2020 demonstrator development.

Training & Professional Development

- **Certificate of Achievement in Power BI, DigDATable - 21/02/2025**
Focus on data visualization, analytical dashboards, and data-driven problem solving.
- **Certificate of Attendance - Web Development Fundamentals (HTML, CSS, JavaScript, AngularJS), Prince's Trust International / 100mentors / Bizrupt - 12/2023 - 01/2024**
Introductory training in frontend web development concepts, including AngularJS-based UI development and client-side application structure

PUBLICATIONS

Publications in Journals

- M. Vardalachakis, N. Papadakis, M. Tampouratzis, “ShinyAnonymizer enhanced version and Beyond: A further exploration of Privacy Preserving Solutions in Health Data Management”, Applied Sciences Journal, Section: Computing and Artificial Intelligence, Special Issue: Data Visualization Techniques: Advantages & Applications. <https://doi.org/10.3390/app14166921>

Publications in Conferences

- M. Vardalachakis, M. Vasilakis, and M. Tampouratzis, “A Comprehensive Analysis of Features, Benefits, Challenges, and Best Practices of Security Information and Event Management (SIEM) Solutions,” Computer Sciences & Mathematics Forum, vol. 12, no. 1, Art. no. 18, 2025. <https://doi.org/10.3390/cmsf2025012018>
- M. Vardalachakis, A. Siatras and C. Kalloniatis, "InvisseeAI: Advanced Healthcare Data Anonymization Platform," 2025 16th International Conference on Information, Intelligence, Systems & Applications (IISA), Mytilene, island of Lesbos, Greece, 2025, pp. 1-7, <https://doi.org/10.1109/IISA66859.2025.11311319>
- M. Vardalachakis and C. Kalloniatis, "The role of Anonymization Techniques in Differential Privacy," 2025 International Conference on Computer Technology Applications (ICCTA), Vienna, Austria, 2025, pp. 14-18. <https://doi.org/10.1109/ICCTA65425.2025.11166256>
- M. Vasilakis, M. Vardalachakis and M. Tampouratzis, "Approaches for Anonymization Methods in IoT Preservation Privacy," 2025 6th International Conference in Electronic Engineering & Information Technology (EEITE), Chania, Greece, 2025, pp. 1-5, <https://doi.org/10.1109/EEITE65381.2025.11166166>
- M. Vardalachakis, M. Tampouratzis, “Privacy Preservation in IoT: Anonymization Methods and Best Practices”, 5th International Conference on Communications, Information, Electronic and Energy System (CIEES 2024), 20-22 Nov. 2024. <https://doi.org/10.3390/app14166921>
- M. Vardalachakis, M. Tampouratzis, M. Vasilakis, N. Papadakis, “The Future of Privacy: A Review on AI’s Role in Shaping Data Security”, IEEE 5th International Conference in Electronic Engineering, Information Technology & Education (EEITE 2024), 29-31 May, Chania, Crete, Greece. <http://doi.org/10.1109/EEITE61750.2024.10654397>.
- M. Tampouratzis, M. Vasilakis, M. Vardalachakis, M. Raftaki, G. Adamidis, M. Antonidakis, “CircuitLib: A Case Study of Spin-Off e- Business in Embedded and Electronic Systems Development”, IEEE 5th International Conference in Electronic Engineering, Information Technology & Education (EEITE 2024), 29-31 May, Chania, Crete, Greece. <http://doi.org/10.1109/EEITE61750.2024.106544>.
- M. Vardalachakis, H. Kondylakis, M. Tampouratzis, N. Papadakis, N. Mastorakis, “Anonymization, Hashing and Data Encryption Techniques: A Comparative Case Study”, IEEE 3rd International Conference on Applied Mathematics & Computer Science (ICAMCS) Lefkada Island, Greece. August 8-10, 2023. <http://doi.org/10.1109/ICAMCS59110.2023.00028>.
- M. Vardalachakis, H. Kondylakis, L. Koumakis, A. Kouroubali, D. G. Katehakis, “ShinyAnonymizer: A Tool for Anonymizing HealthData”, in ICT4AWE, <http://doi.org/10.5220/0007798603250332>.

