



PAROMA-MED PARTNERS

PROJECT PARTNERS



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PAROMA-MED website



PAROMA-MED

Privacy-Aware and Privacy-Preserving Distributed and Robust Machine Learning

<https://paroma-med.eu/>



We are building a platform based on hybrid-cloud delivery framework for privacy and security assured services and applications in federative cross-border environments.

ROBUST MACHINE LEARNING PLATFORM



For Medical Applications

INCLUSIVE

Develop a federation marketplace supported by a platform service for the automatic attestation of federation partners and for their inclusion in the service and data provider catalogue.



FRIENDLY

Develop a user-friendly platform service and policy framework to support the developers in defining high-level applications and privacy & security requirements, including the right to be forgotten.



SECURE

Develop federative identity management solution and an access management solution based on zero trust principles. Develop a software defined trusted execution environments that exploit hardware isolation and security capabilities.



CLOUD-NATIVE

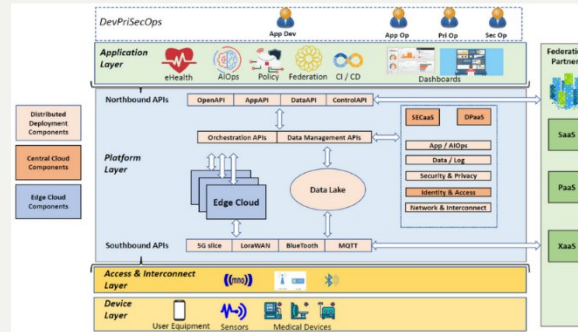
Implement open-source cloud-native solutions, to support efficiency and scalability. Validate and evaluate the framework by the development of a comprehensive use case with real users in the healthcare sector.



"HEART, SMARTS, GUTS, AND LUCK"
BY ANTHONY, RICHARD, AND TSUN-YAN

Lead team at
realizing our vision

Figure 1: High-Level Architecture



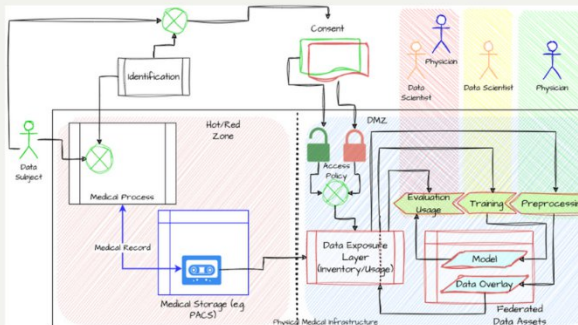
METHODOLOGY & USE-CASE DESCRIPTION

The PAROMA architecture is composed of Local Processing Nodes at the edges of the hybrid cloud interconnecting environments with sensitive health data. These local nodes provide necessary computational and storage resources for processing locally the acquired bio-information and generating online results.

Data validation may happen with in collaboration with the remote nodes, by exchanging the locally produced bio-information and/or intermediate AI results. Local nodes generate local AI-based assessment results but also can get fine-tuned with respect to the underlying data models being exploited by the AI/ML logic, by comparing and using other training data sets residing in the cloud.

The developed use case will be dedicated to the qualitative assessment of cardiac anatomy, based on cardiac imaging, namely the characterization of myocardial wall thinning from cardiac Computed Tomography images. ML methods based on Deep learning will automatically extract myocardium wall boundaries, to compute their thickness, which has demonstrated their ability to segment cardiac images.

Figure 2: Use-case deployment



PROJECT GOALS

1

Efficiency and scalability will be insured by the implementation of cloud-native solutions, while future adoption and further development is insured by open-source implementations.

2

The project will validate and evaluate the PAROMA-MED framework by developing of a comprehensive Use Case with real users in the Healthcare sector.

3

The project will create impact on the application- creation and delivery ecosystem (including standardization and legal stakeholders), on society and environment and manage the impact via dedicated activities and communication channels

PROJECT OUTCOMES



Scalable and reliable privacy-preserving technologies for federated processing of personal data and their integration into real-world systems

User-friendly solutions for privacy-preserving processing of federated personal data registries by researchers

Contribution to the promotion of GDPR-compliant European data spaces for digital services and research

