THIS PROJECT IS PART OF THE NEXT GENERATION IoT
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12th CONASENSE SYMPOSIUM 2022
EU-IoT Hackathon - Sustainable Next Generation IoT Applications

TERMINET: nexT gEneRation sMart INterconnectEd joT

University of Western Macedonia

iTHACA Internet of THings & AppliCAtions (ITHACA) Lab

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 957406.

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Project Identity & Consortium

Project Identity & Consortium

- ✓ Call: H2020-ICT-2018-20
- ✓ Topic: ICT-56-2020
- ✓ Type of action: RIA
- ✓ Total Budget: € 8.000.000,00
- ✓ Active period: 1 Nov 2020 – 31 Dec 2023

4 Industries	5 Universities	3 Research Centers	15 SMEs

Consortium (27)

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Motivation, Challenges & Objectives

Motivation

Traditional cloud computing is not able to support real time applications.

A new cost effective approach is needed

- New IoT systems could be closer to the data source
- Low latency services and applications are viable
- Data privacy could be increased

Traditional manual configuration and device management is no longer viable.

Combination of Smart Technologies

Need for enhancing IoT

- Heterogeneous technologies, devices, and platforms
- Pervasive interconnection of people, services, and devices
- Embedded intelligence, connectivity and processing capabilities at the edge of the IoT network

TERMINET Objectives

Six Objectives

Objective #1

Flexible, open, and decentralised next generation IoT reference architecture for new real-time capable solutions.

Objective #2

SDN-enabled multiple-access edge computing environment for IoT and mission-critical and vertical solutions.

Objective #3

Moving AI to the edge by using cutting-edge ML technologies.

Objective #4

Security by design based on **attestation modelling, distributed and decentralised blockchain, and enterprise-level privacy**.

Objective #5

Tactile IoT model by adding **human-centric perspective and sensing/actuating capabilities**.

Objective #6

Design intelligent IoT devices for new generation IoT use cases, by fostering digital business development.

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TERMINET Business Logic & Architecture

TERMINET Business Logic

Combined SDN and NFV networking architecture, utilizing containisation

SDN & NFV

Federated Learning Framework: FLF-DMLC, FLF-DMOS and FLF-DMP

Federated Learning

AR/VR Contextual Framework, Digital Twins, IoT Devices Inventory, Haptic devices

AR/VR, Digital Twins, IoT Inventory

TERMINET Secure Vertical IoT Network Framework (SV-IoT-NF): Trust, privacy and authentication among the various entities, using Blockchain

Security, Privacy & Trust

TERMINET Integrated Platform

TERMINET Architecture

Application Layer – APP-L

This layer is implemented in the cloud to offer a wide coverage.

Platform Layer - PLA-L

Platform Controller; virtualization enhancement; NFV Orchestrator; Global AI models ; Data Management/Storage

Intelligence Layer – INT-L

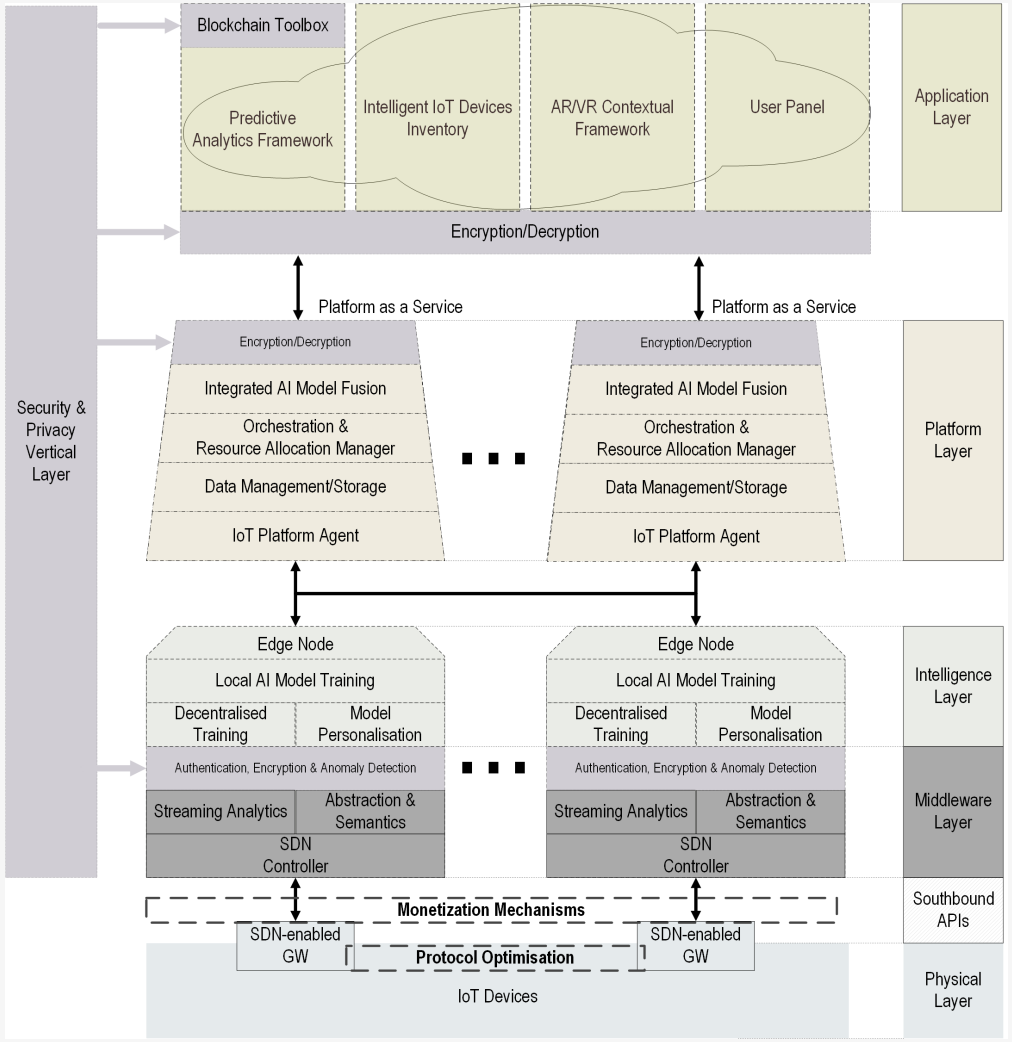
Fed by filtered IoT data streams for applying the TERMINET advanced federated learning approach.

Middleware Layer – MID-L

Intermediate layer which collects and processes the various data coming from the IoT devices at the physical layer.

Security & Privacy Vertical Layer – SPV-L

It aims to ensure the security and privacy for all layers.



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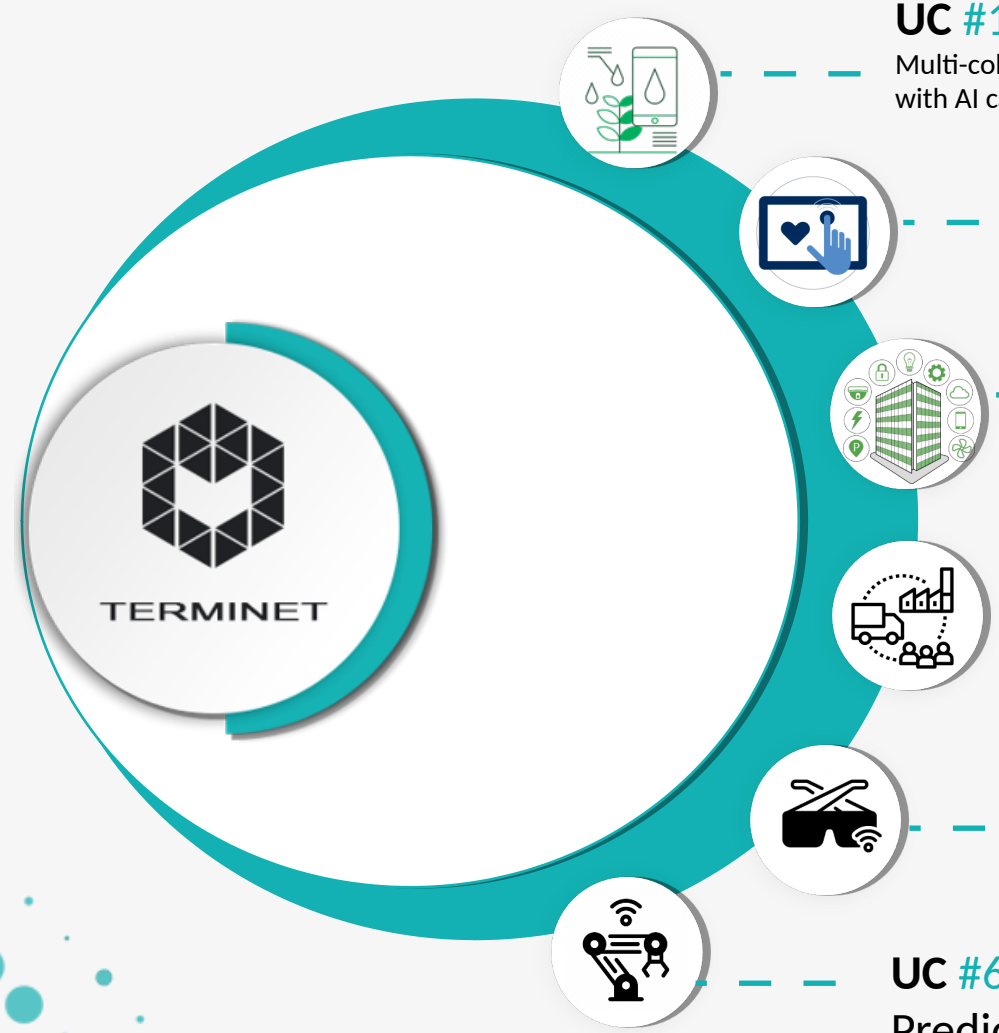
TERMINET Use Cases

Use Cases



UC #1: User-Centric Devices in Smart Farming

Multi-collected and heterogeneous data coming from crops, livestock, and mixed farming systems are coupled with AI capabilities to enhance agriculture systems' sustainability.

UC #2: Pathway of Personalized Healthcare

Higher level of medical education to health practitioners, leverage diagnosis and improve patient satisfaction and safety.

UC #3: Smart, Sustainable and Efficient Buildings

Transform buildings into smart buildings and optimize their energy consumption and harvesting.

UC #4: Prediction and Forecasting System for Optimizing the Supply Chain in Dairy Products

Provide efficient supply chain forecasting, based on different types of production and sales data.

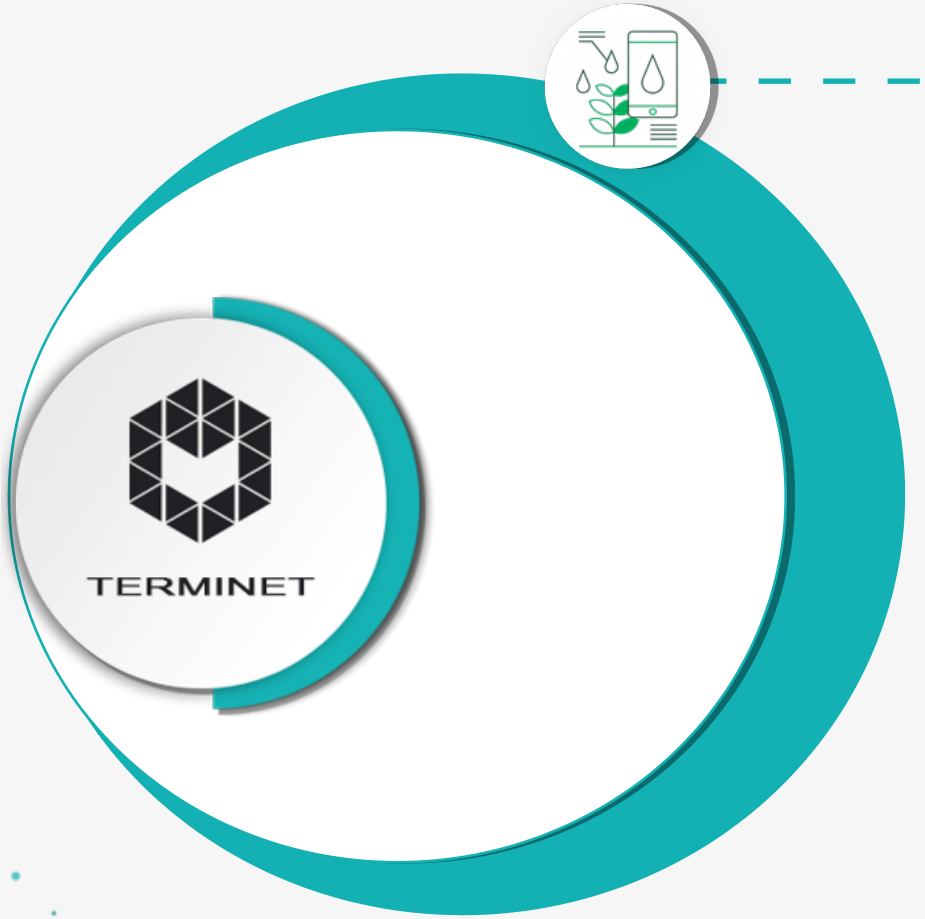
UC #5: Group Training Surgery Using VR enabled IoT Technologies

Enhance the understanding of treatment by efficiently providing a virtual training environment for medical personnel.

UC #6: Mixed Reality and ML Supported Maintenance and Fault Prediction of IoT based Critical Infrastructure

Reduce the operational costs of the end user and the burden of maintenance engineers.

Use Cases



UC #1: User-Centric Devices in Smart Farming

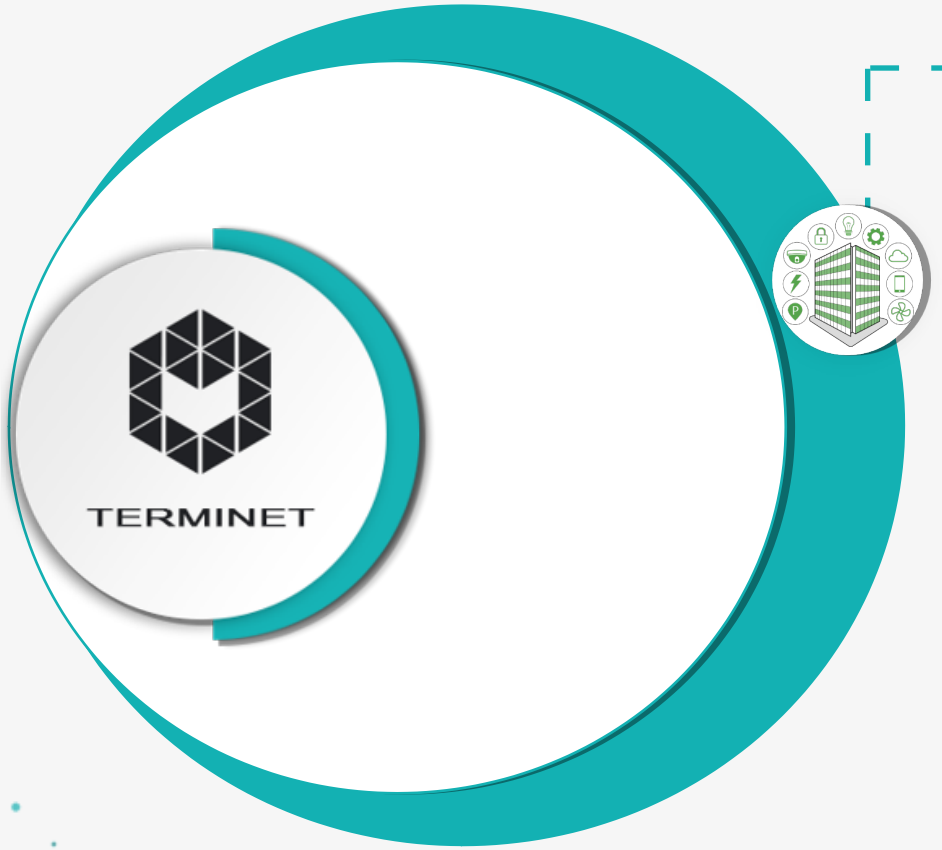
- Enhance agriculture systems' sustainability.
- Couple heterogeneous data from crops, livestock with AI capabilities.
- Collect animal-like features via wearable collars.
- Farm monitoring via intelligent IoT AR-enabled devices.

Use Cases

UC #2: Pathway of Personalized Healthcare

- Higher level of medical education to health practitioners.
- Leverage diagnosis.
- Improve patient satisfaction and safety.
- Information exchange between different hospital departments.
- Assessing the state of patients and propose possible treatments.

Use Cases



UC #3: Smart, Sustainable and Efficient Buildings

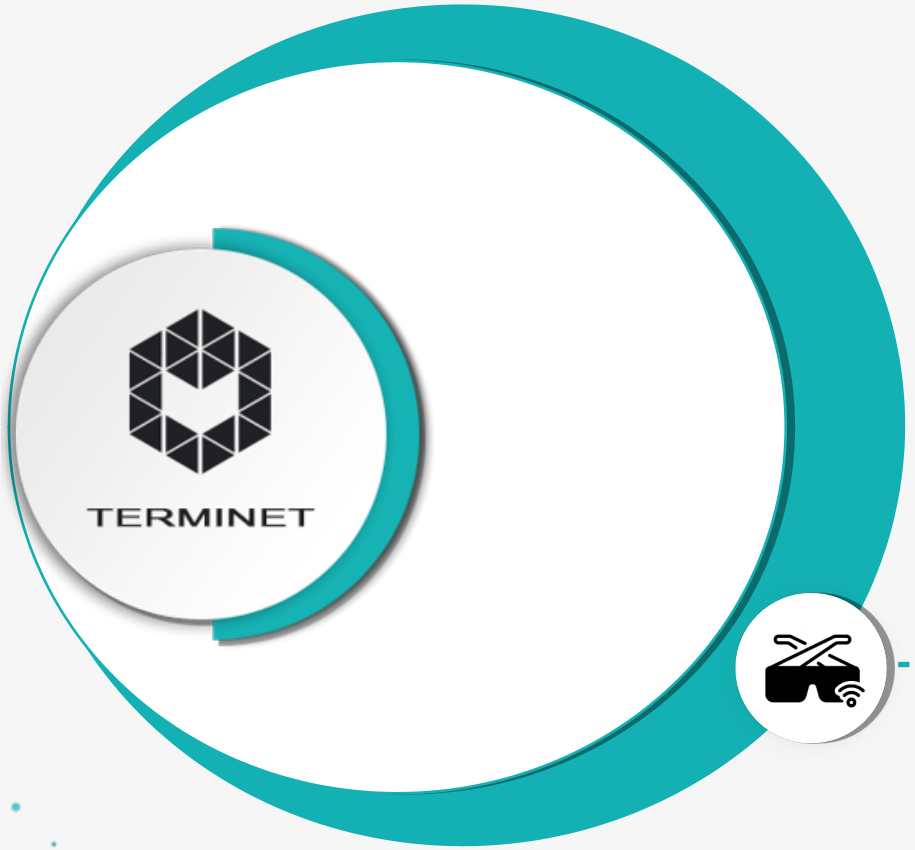
- Transform buildings into smart buildings.
- Optimize energy consumption and harvesting.
- Enable automated building control.

Use Cases

UC #4: Prediction and Forecasting System for Optimizing the Supply Chain in Dairy Products

- Efficient supply chain forecasting, based on different types of production and sales data.
- Reduce run times.
- Precious saving in terms of energy and labour time.
- More efficient trucks' flow.
- Faster delivery time.
- Increased productivity.

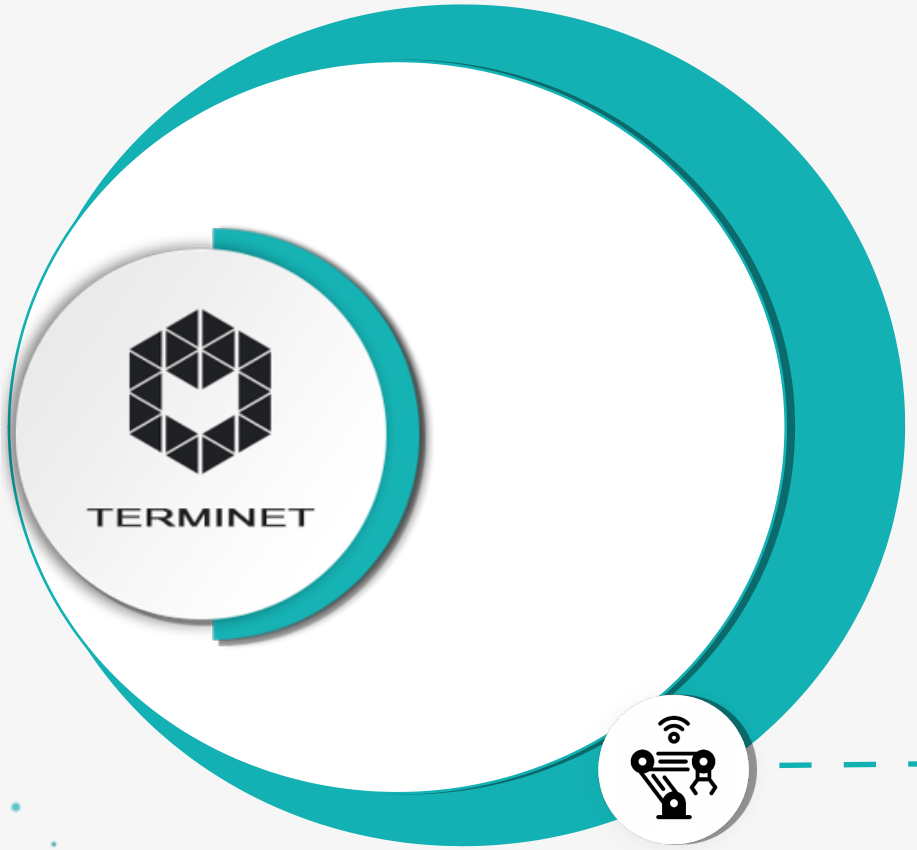
Use Cases



UC #5: Group Training Surgery Using VR enabled IoT Technologies

- Enhance the understanding of treatment.
- Provide a virtual training environment for medical personnel.
- Reduce latency in tools operation.

Use Cases



UC #6: Mixed Reality and ML Supported Maintenance and Fault Prediction of IoT based Critical Infrastructure

- Training on maintenance for the newly acquired equipment.
- Reduce the operational costs of the end user.
- Reduce the burden of maintenance engineers.
- Adapt new sophisticated products.

Thank you for your attention!

TERMINET website : https://terminet-h2020.eu/

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