One Health
Student Conference
USAMV București

OPTIMIZING ENVIRONMENTAL INTELLIGENCE IN AN INTERNET OF THINGS SYSTEM FOR SUSTAINABLE HEALTH MONITORING

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Introduction

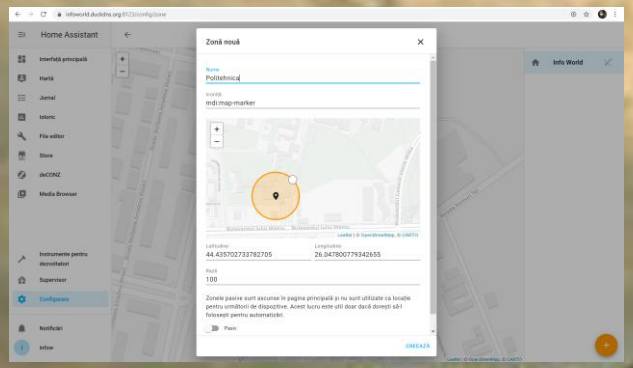
IoT and environmental health: a transformative fusion in technology shaping our world.

The study emphasizes memory management's crucial role in optimizing IoT systems, especially in environmental health applications.

The research underscores memory limitations as a key hurdle for low-end IoT devices in environmental monitoring.

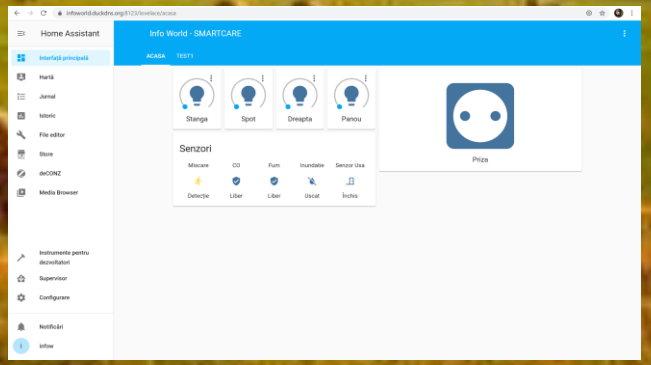
IoT devices like air quality sensors and presence detectors stress the need for efficient memory management.

Materials and methods



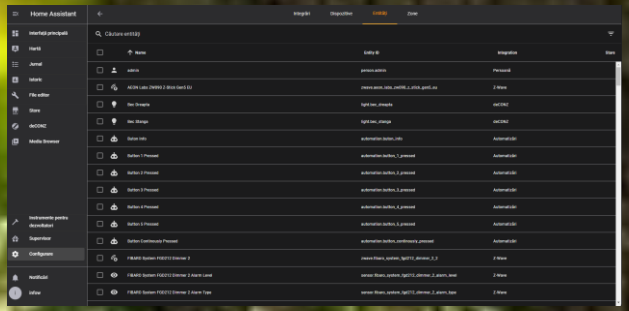
For a new location, a name must be added, then you have to choose the exact position on the interactive map or to introduce the values for latitude and longitude.

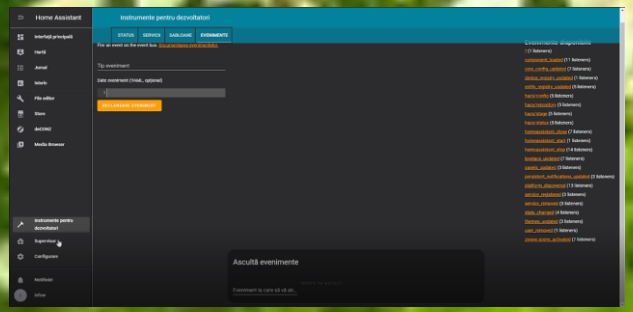
After the authentication, the user will have access to the main interface of the system. With this, the user can verify the status of multiple IoT devices, such as indoor lightning illumination, along with the presence of movement, CO, smoke, humidity, and door opening.



Materials and methods

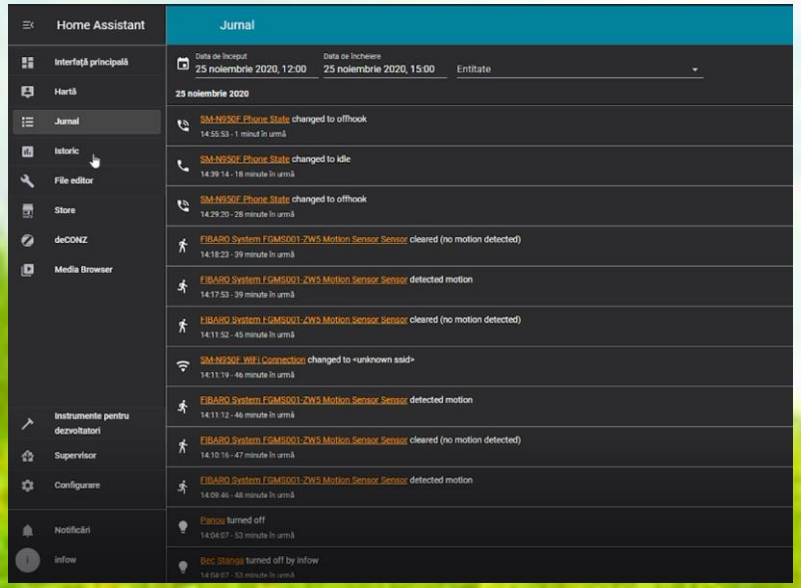
Entities in the "Entities" tab are represented device components and actions, like temperature sensors or light bulbs. For example, a light bulb that monitors the indoor temperature has as device exactly the light bulb which contains the circuits and the light, and the entities are a temperature sensor and a light bulb.





Events can be automatically called from the platform to test their behaviour by pressing the Trigger Event button. You can press a button and then observe what happens with all the analysed factors and this brings some improvements to the entire smart system for managing the environmental health.

Results and discussions



The Log button generates a report showing event types (e.g., motion detection, light status changes, mobile device calls), linked to their respective entities/devices. You can choose a specific time frame for monitoring events, aiding in observing changes over time. This report helps users track activity, analyze data, and manage environmental factors for better home quality.

Results and discussions

Table 1. Memory Allocation Breakdown for IoT Sensors in Environmental Health Monitoring

Sensor	Memory Allocation (KB)	Purpose and Insight
Indoor Illumination	120	Ensures precise monitoring of lighting conditions, crucial for environmental assessments.
Movement Detection	80	Facilitates the rapid identification of spatial changes, enabling real-time responses to dynamic environmental conditions.
CO Levels	150	Substantial allocation for robust and accurate assessment of air quality, a cornerstone in environmental health initiatives.
Smoke Presence	100	Allocated memory to promptly detect and respond to potential fire hazards, contributing to safety and environmental well-being.
Humidity Levels	90	Dedicated memory for meticulous examination of moisture content, pivotal in assessing environmental conditions and potential health impacts.
Door Status	60	Judicious allocation to monitor door status in real-time, contributing to both security and environmental health considerations.

As illustrated in Table 1, the allocation of memory resources across diverse environmental sensors, namely monitoring indoor illumination, movement detection, CO levels, smoke presence, humidity levels, and door status forms the backbone of accurate and timely data collection.

Conclusions and recommendations

- Our exploration into the realm of IoT systems and environmental health has unravelled the dynamics of memory management, unveiling its role in ensuring the optimal functionality and adaptability of the system.

- Looking ahead, future research in the domain of memory management for IoT systems in environmental health monitoring holds space for exploration and enhancement.

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QUESTIONS?

Thank you for your attention!

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