Fraunhofer PORTUGAL

 # Newsletter 07
MAY 2022

Smart Living

Efficiency, quality of life, innovation, sustainability, digital solutions. When questioned about Smart Living, these were some of the key expressions used by the team from the Fraunhofer Portugal community (headquarters and both research centres, AICOS and AWAM).

In this issue, we show you our vision (and work!) of a smart way of living.

New patent granted

Fraunhofer Portugal has recently been granted a new patent for a technology developed by its research centre, FhP-AICOS, within the OPERATOR 4.0 project.

We have talked to the involved team - Duarte Folgado, Marília Barandas and Prof. Hugo Gamboa - about this solution.

Read full interview

Digital transformation: optimizing and improving

As a great part of our lives is spent at work, a Smart way of Living would necessarily involve an improved work environment and conditions. In line with this thought, FhP-AICOS has been working closely with the industry, creating and implementing cutting-edge solutions aimed at supporting companies within the digitalisation process. Optimizing procedures, reducing costs, increasing efficiency, and supporting every day, yet cumbersome tasks, are some of the goals when it comes to digital transformation.

Know more

Digital solutions for sustainable use of water

Smart Living also stands for sustainability.
Within LoRa4UProbes, a project being promoted by AQUAGRI, FhP-AICOS is creating technology to monitor soil humidity more accurately, thus, reducing the usage of water. A first prototype of a wireless sensing probe that is placed underground, making the collection of data more efficient, safe and less exposed to the elements, is currently being tested to validate technical aspects related to the reliability of Long Range Communication technologies.

Know more

ParentCoach

From work to sustainability, and in all aspects of our lives, Smart Living may be enhanced by the use of technology. As a simple - yet, powerful! - example, we can remark ParentCoach: an interactive chatbot that will provide accurate information, giving the necessary support to first-time parents, who normally feel overwhelmed because of their lack of experience.

The solution aims to assist during the postnatal period, avoiding bigger health problems or complications in the future.

Know more

Highlight_

What is Smart Living?

When put to good use, technology will help to overcome inequalities, create more functional cities, anticipate health problems, and fight climate change calling upon people to participate on the process of making efficiency, security, and well-being the flags of a smart society.

Play video

Smart Living concerns the implementation of technology in people, homes, offices, and cities to enhance our daily life. It leverages connectivity, data, analytics, and human-machine interaction, to provide personalized and efficient services to end-users.

Duarte Folgado | Researcher at FhP-AICOS

Managing one's daily life with ease and free time.

Cristiana Braga | Researcher at FhP-AICOS

Smart living is the future. Is connectivity everywhere, anytime.

Marisa Rio | Senior Researcher at FhP-AWAM

Smart living is making an eco-friendly living by minimizing waste.

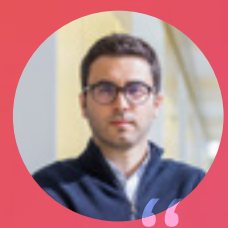
Ricardo Graça | Researcher at FhP-AICOS

A way of living where intelligent cyber-physical systems meet user interaction and experience to ease our day-by-day.

Manuel Monteiro | New Business Development Group Leader at FhP-AICOS

An IT-based product/service for simplifying everyday home routines.

Carlos Miguel | Lab Manager at FhP-AWAM



For me Smart Living is living originally and in innovation, with more quality of life.

Stefanie Goetz | Administrative Director at FhP

I think Smart Living refers to the use of technology, specifically smart devices, to help and support everyday tasks.

Ricardo Melo | Senior Researcher at FhP-AICOS

Has everything to do with balance (…) and I truly believe technology can help us achieve this balance as individuals, as citizens in a community and as humans living on this Earth.

Isabel Cortez | Internal Communication Assistant at FhP-AICOS

Solutions that make life more efficient and sustainable.

Alberto Carvalho | Researcher at FhP-AICOS

The use of technology to ease and assist us in everyday living.

António Antunes | Recruitment and Selection Officer at FhP

Smart living relies on digital solutions to sustainably improve our quality of life.

Waldir Júnior | Innovation Lead for Digital Farming & Senior Researcher at FhP-AICOS

Smart Living is all about comfort, security, energy efficiency and sustainability. However, it goes far beyond the interconnectivity of devices. The way we see it, living smart is all the above-mentioned answers (photo), enabled by technology.

Since the beginning of times, technology has been the driving force of progress. Thinking back on the wheel that allowed people to travel bigger distances, or the electricity that brought light into otherwise dark places, or even the Internet creating the so-called global village, technology has been in fact the driving force that made us progress as a society. And the endless possibilities and challenges around it are both exciting and overwhelming.

At both Fraunhofer Portugal's research centres - AICOS and AWAM - we believe that technological innovation is one of the answers to improve our well-being, without compromising the sustainability of services and the environment. When put to good use, technology will help to overcome inequalities, create more functional cities, anticipate health problems, and fight climate change calling upon people to participate on the process of making efficiency, security, and well-being the flags of a smart society.

To attain such reality, the capacity of objects to sense is one of the attributes that allow for the efficiency and well-being we strive to achieve. Getting relevant data out of objects as a result of their capacity to sense, process and interconnect, will give us the power to improve systems, safeguard people, manage energy levels and offer communication capacities. The IoT solution – Kallisto – developed by Fraunhofer Portugal AICOS includes a hardware and software modular technology which allows the collection of data from about almost everything. When we say "almost everything", we really mean it. Information about our routines, our health and well-being, our activity, may it be at home, on the street or in our workplaces, may now be collected from several different sensors embedded in all kinds of devices we use daily. However, living smart cannot be "reduced" to sensing data. On the contrary, living smart is all about data collection but, most important, is about the meaning and insights obtained from that data as well as the technological solutions developed from the needs perceived.

To use progress and technology to make life more simple, healthier, happier, while preventing the planet to deteriorate. That is Smart Living!

Due to its transversality, the smart living concept encompasses citizenship, digital agriculture, the environment and sustainability, health and well-being, among many other areas. Staying true to its principles – of being a driving force in innovation and fostering research of practical utility – Fraunhofer Portugal's research centres operate towards these goals.

Newsletter #07 | Smart Living

Itech Minute_

David Sousa, Researcher

At 27, and with a background in Electrical and Computer Engineering, David Sousa has recently joined FhP-AICOS, more precisely the Connected Things group, where he is working on the development of firmware for embedded systems in the area of the Internet of Things (IoT).

Get to know him and the work he develops at Fraunhofer Portugal AICOS.

Trends_

The role of IoT in Smart Living

The availability of low-cost sensors and internet connectivity enables scenarios such as healthcare, agriculture, smart cities, intelligent transportation systems, and surveillance.

Filipe Sousa
Head of Connected Things at AICOS

The availability of low-cost sensors and internet connectivity enables scenarios such as healthcare, agriculture, smart cities, intelligent transportation systems, and surveillance. For people, this means the automation of some daily tasks using Internet of Things (IoT) devices, not only at home but also at work and through people's daily activities.

IoT are electronic devices used to opportunistically sense data from people and the surrounding environment and actuate when needed, process data, and transmit/receive to/from other devices, ensuring data integrity. Using modular platforms that embed sensing, processing, energy management and radio communications, we can easily integrate a new range of sensors or retrofit by adding new technology to old systems that can be of practical use in a wide array of applications.

When developing things for monitoring different parameters, we must focus on the long-term operation. These scenarios demand sustainable energy management. Therefore, it is essential to integrate energy harvesting sources and develop smart energy management mechanisms. Embedded microprocessors can be used to process data locally and decide, at each time, if it would be energy-wise to transmit raw or pre-processed data through the network. Due to the limited computational resources of these tiny processors, there is a need for fine-tuning machine learning algorithms for pre-processing data, leading to a loss in precision that must be minimised. Networks of connected things enable devices to leverage surrounding computational resources opportunistically, including those available in similar sensor platforms or even mobile devices.

IoT can be applied to a range of scenarios. At work, IoT can be used to sense workers' movements to assess ergonomics and environment, such as temperature, noise, vibration, and lights condition. The devices must work during more than one shift, so energy management is important and to minimise the information collected, the algorithms must run in these devices. IoT can be retrofitted into old machines at home, such as cooking machines, connecting these devices to the internet and ensuring a remote and automated operation. The retrofitted cooking machine becomes a smart device that can be operated through a tablet that can improve user experience and interaction. IoT can also be used as wearable devices to monitor people's daily activities that can trigger home automation scenarios, such as turning on the lights when the user arrives home or enters the kitchen or bedroom.

IoT is important for a smart living if it can improve people's life. To ensure a positive impact on people's lives, technology should improve the user's experience and reduce the user's involvement in cumbersome tasks. To attain this goal people must be involved when designing and developing technology and we should study their acceptance in real scenarios. Moreover, users' data should be protected, and secure communications should be assured to avoid personal data breaches. The role of FhP-AICOS is to develop IoT devices to fit people's needs.

In the 3rd Person_

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Responding to a PRODUTECH challenge within the scope of the DISRUPTIVE project, the Fraunhofer Portugal AICOS’ team designed a three-session mentoring program on Industry 4.0. These sessions were attended by different companies and entities from the production technologies ecosystem. The general opinion, which I share, is that expectations were greatly exceeded due to the trainers’ mastery of the themes and field experience, the real case scenarios presented that also responded to the needs of the participants as well as the open knowledge sharing”.

Maria João Samúdio, Projects Coordinator at PRODUTECH

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