Press release
Nota de prensa

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An IMDEA Networks research team has won the first EIT Jumpstarter award with the business idea LiFi4Food

An IMDEA Networks research team has won first prize in the food category of the competitive European EIT Jumpstarter program for its business idea **LiFi4Food, which seeks to provide solutions for digital and precision agriculture**. The prize valued at €10,000 is earmarked for the creation of this revolutionary startup. The grand final took place in Krakow (Poland) on November 29, where PhD students Javier Talavante and Dayrene Frómeta attended on behalf of the group.

LiFi4Food offers an **integrated, innovative, and sustainable communication system formed by self-sustainable and battery-free IoT** (Internet of Things) **devices** to monitor and control environmental parameters in high-tech agri-food facilities such as vertical farms and greenhouses. It takes advantage of the LED lamps already installed in such sites to deploy a LiFi network that supplies the battery-free sensors (equipped with solar cells) with both power and data.

The 'LiFi' wireless communication technology that gives this startup its name is what makes all this possible, as it alleviates the problem of radio frequency spectrum saturation in 6G networks by transferring operation to the visible light band. Thus, LiFi enables retrofitting the lighting infrastructure for communications, which considerably reduces deployment and installation costs.

LiFi4Food, the sustainable solution to food shortages

Do we have a secure food supply for the future? That was the question the IMDEA Networks team asked themselves and which has led to the birth of LiFi4Food. Population growth, climate change, and soil degradation are jeopardizing reliable and quality food sources for the coming years. "**LiFi4Food aims to address the challenge of food scarcity** by promoting food production in high-tech agri-food facilities such as vertical farms and greenhouses. From LiFi4Food we want to provide these facilities with battery-free IoT devices with sensors and actuators to help them operate these farms in a more efficient and sustainable way," explains Dayrene Frómeta, one of its founders and a PhD student at IMDEA Networks. The experience and training on exploitation that she acquired in the H2020 ITN ENLIGHT'EM project, coordinated by our research institute, have been fundamental to reach such a milestone.

Javier Talavante, a PhD student at IMDEA Networks, is also part of the founding team. He is currently involved in the SOMIRO project, on the control of tiny robots by visible light communication. He applies his knowledge of working on small IoT devices and his experience

in interacting with top European partners.

Our postdoctoral researcher Borja Genovés (who works as a project manager for projects such as H2020 ITN ENLIGHT'EM and as a SOMIRO researcher) has applied his expertise in visible light communication and IoT to this initiative. In addition, the team has been led by Dr. Domenico Giustiniano, Research Associate Professor at IMDEA Networks, who has applied not only his scientific knowledge but also the knowledge acquired in IE Business School's executive training on fundamentals and management skills for scientists and researchers.

With their startup LiFi4Food they aim to **increase the sustainability of agri-food facilities by reducing their CO2 emissions from food production and eliminating the use of hazardous materials such as lithium for their manufacture.** "We also promote food production close to the consumer, which will reduce CO2 emissions due to food transportation. In addition, the vast amount of data collected by our system will increase the traceability of food production systems and thus the trust that consumers place in them," says Dayrene.

The big advantage of the LiFi4Food system they will be implementing is that it can be deployed in vertical farms, high-tech greenhouses, and aquaponics, providing the agriculture sector with battery-free IoT devices with sensors and actuators to help them operate these farms more efficiently. "**Our IoT devices will be distributed among the crops to continuously measure parameters such as temperature, humidity or Ph**. This data will be sent to our servers and presented to the end user in our LiFi4food app, so they can also communicate with the IoT devices to, for example, take a measurement or activate actuators or the irrigation system," says the researcher.

By deploying the system they have created, vertical farms and high-tech greenhouses can reduce their operating costs. **By automating tasks and optimizing the use of resources, these facilities can reduce energy, lighting, water, and labor costs**. In addition, precision control will increase production yields and produce better quality crops.

In continuous training

During the 8 months of the program, the IMDEA Networks team has worked on the search and validation of innovative ideas to develop a business model to create a startup called LiFi4Food. **They have received training on the Silicon Valley lean start-up methodology** transferred to the European environment and learned how to refine the business, market segmentation, customer value proposition, financial aspects, investment, and legal fundamentals. The initial number of teams that participated in the training was 210, and many more applied.

As a result, the European Institute of Innovation and Technology (EIT) -a European-wide public agency that seeks to promote innovation in business projects- and Jumpstarter, an edition of awards focused on start-ups, have chosen the IMDEA Networks team's idea as one of the winners.

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About us

IMDEA Networks Institute, promoted by the Regional Government of Madrid, is a research organization on computer and communication networks whose multinational team is engaged in cutting-edge fundamental science and technology. As a growing, English speaking institute located in Madrid, Spain, IMDEA Networks offers a unique opportunity for pioneering scientists to develop their ideas. IMDEA Networks has established itself internationally at the forefront in the **development of future network principles and technologies**. Our team of highly-reputed researchers is designing and creating today the networks of tomorrow.

Some keywords that define us: 5G, Big Data, blockchains and distributed ledgers, cloud computing, content delivery networks, data analytics, energy-efficient networks, fog and edge computing, indoor positioning, Internet of Things (IoT), machine learning, millimeter-wave communication, mobile computing, network economics, network measurements, network security, networked systems, network protocols and algorithms, network virtualization (software defined networks – SDN and network function virtualization – NFV), privacy, social networks, underwater networks, vehicular networks, wireless networks and more…

IMDEA Networks Institute
28918 Leganes (Madrid) Spain
Avda. del Mar Mediterráneo, 22

+34 91 481 6210
mediarelations.networks@imdea.org
www.networks.imdea.org

Twitter: @IMDEA_Networks | Facebook | Instagram | Flickr | YouTube