Press release
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ORIGAMI: anticipating the future of more connected, efficient and sustainable telecommunication infrastructures

The ORIGAMI (Optimized Resource Integration and Global Architecture for Mobile Infrastructure for 6G) project is now underway. The project, funded by the European Commission under the Horizon Europe program, will spearhead architectural innovations for the **next generation of 6G mobile networks**, to enable innovative applications, new business models, and substantial reductions in energy consumption.

By proposing and developing three critical architecture innovations - Global Services Based Architecture (GSBA), Zero Trust Exposure Layer (ZTL), and Continuous Compute Layer (CCL) -, **ORIGAMI will create unique global standards, promote green transition**, give new impetus to accessibility and inspire innovative applications and new business models, maximizing the exploitation of AI-based Network Intelligence functions. The project will conduct eight real-world demonstrations at six experimental sites and two large-scale international datasets from two major operators, which will validate its technology and research results.

"The environment proposed by ORIGAMI will streamline communication and interoperability at all levels of the network, pave the way for truly global standards, **democratize access to extremely heterogeneous computing resources**, and allow third parties to securely program their virtual networks in zero-trust environments", says **Dr. Javier García Rodrigo**, Project Coordinator at Telefónica Digital Innovation. “This research – Dr. García Rodrigo continues - is probably the first in Europe to holistically address substantial barriers to the success of 6G, from limitations in the control and interoperability of virtualized infrastructure, to the lack of adequate support for global operations and billing, which are increasingly common in real-world scenarios”.

The project extends the scope of previous works such as DAEMON, led by IMDEA Networks Institute and based on the 5G architectural model, intending to increase the full potential of virtualization and programmability. To achieve this objective, ORIGAMI will adopt a completely renewed perspective: proposing a novel cross-plane architecture for 6G networks that supports original exposure and computation layers. A framework of functionalities within which actions such as supporting the global operation model of vertical applications, mass IoT deployment, or maximizing the potential of virtualization and programmability stand out.

Marco Fiore, Principal Investigator of IMDEA Networks Institute in the project, highlights the institution's contribution to this scientific performance: "**We bring our expertise in AI-based network function design and network user plane programmability**. Specifically, we will

work to develop and demonstrate in industrial-level experimental testbeds new machine learning models that can operate on heterogeneous user planes through efficient model design and hardware allocations. This approach will enable more agile access to the capabilities of modern programmable transport domains. For network operators, our solutions will translate into increased speed, accuracy, and scalability compared to the current state of the art."

An example of technology transfer to society

- Current overall energy use by the telecommunications industry must be reduced, as the industry consumes 2-3% of the world's energy. ORIGAMI will develop **solutions that enable energy-wise RAN operations**, including 2 times more efficient energy use and a 35% reduction in energy consumption.
- Another objective is to help **bridge the gap between rural and urban connectivity** to build more efficient mobile networks, (aiming for a 10x improvement in RAN cost efficiency, or savings of the order of 50% in CAPEX to support global operations).
- In addition, as ORIGAMI will contribute to developing more efficient and **better performing mobile networks, with lower latency, higher throughput, and higher reliability**, many public sectors and people's daily activities will be significantly improved, as life today is totally dependent on the widespread use of mobile networks.
- ORIGAMI will help deliver better services beyond mobile networks. With the advent of 5G and new paradigms such as network slicing, mobile networks can provide customized services to different vertical industries. In this way, **many services critical to society can be digitized** and substantially enhanced, including education, healthcare, transportation, etc.

Source(s): IMDEA Networks Institute

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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…

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