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Kick- off meeting for ICFO coordinates EU project: 2DNEURALVISION

Project brings together partners from academia, SMEs, lar e companies and multinational enterprises to develop a no el low-power consumption, any weather, any light computer vis on system

October 24, 2023

The Horizon Europe project **2DNEURALVISION** (2DNV) kicked off on 9th - 10th October with a meeting at ICFO. Funded with 5.5 M? from the European Commission, the initiative will seek to investigate the **next generation of computer vision** and in particular, to develop enabling photonic and electronic integrated circuit components for a novel low-power consumption computer vision system that can be used under any weather, any light conditions.

The project consortium is made up of **7 partners** from **4 different European countries**, coordinated by ICFO (ES), and with the participation of QURV Technologies (ES), BLACK - Black Semiconductor GMBH (DE), UHEI - Heidelberg University (DE), IMEC (BE), Volkswagen Aktiengesellschaft (DE), FI Group (PT).

The kick-off meeting which took place at ICFO's facilities, instigated the first contact betwee all partners, who shared their technical backgrounds and presented their expecte contributions to the project. The meeting ended with a Lab tour, followed by a planning o the upcoming activities and deliverables

Gerasimos Konstatantos, project coordinator at ICFO, commented: i¿½am very excited and proud to coordinate this multidisciplinary effort that aspires to achieve major breakthroughs in computer vision technology for machine imaging and automotive applications. 2DNV will innovate image sensors with high performance, low cost and scalable manufacturing technologies as well as demonstrate optical neural networks with unprecedented power efficiency and computation capabilities. At the heart of this project lie 2D materials (Graphene and TMDCs - Transition metal dichalcogenide monolayers) and quantum dots, two material platforms whose impact and importance have been recognized with 2 Nobel Prizes. I am looking forward to closely working with all partners that are leaders in their corresponding fields, to bring this technology closer to market for the benefit of society at large.i¿

2DNEURALVISION, a major step toward optical neuromorphic systems

By developing an all-optical neural network based on a photonic integrated circuit with graphene-based active elements, the project aims to develop the enabling components for a low-power consumption, computer vision system that can be used for any weather, any light conditions. These components are a 2DM enhanced wide spectrum image, sensor and optical neural network with enabling 2DM passive and active elements. Additionally, the use of two-dimensional materials (2DM) will make devices smaller in size and with greater functionality compared to what can be achieved with silicon technologies today.
In this context, the scientific achievements of this European project will have enormous societal impacts by enabling disruptive improvements in the automotive, AR/VR, service robotic, and mobile device sectors.

2DNEURALVISION, a wider impact in the European autonomy in strategic areas
The **project expects to provide significant advances** towards the integration of 2DM technology by developing European competence in semiconductor process technologies with the development of waferscale BEOL (Black End of Line) processes for graphene and TMDCs (Transition-metal dichalcogenide).
Consequently, it will also have a **wider impact in i¿½Europe's open strategic autonomyi¿½** by sustaining first-mover advantages in strategic areas including AI, data, robotics, quantum computing, and graphene, and by investing early in emerging enabling technologies, **reinforcing the European industry leadership** across the digital supply chain and **robust? European industrial and technology presence**in all key parts of a greener digital supply chain, from low-power components to advanced systems, future networks, new data technologies and platforms.