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FRAUNHOFER INSTITUTE FOR COMPUTER GRAPHICS RESEARCH IGD

PRESS RELEASE

Artificial intelligence in the smallest space

Network of excellence with Fraunhofer participation paves the way for edge AI technologies

The European Network of Excellence "dAI^EDGE" promotes the application of Artificial Intelligence (AI) on edge computing platforms - Fraunhofer IGD is one of the project partners. By combining edge computing and AI (Edge AI), devices can make decisions in a few milliseconds by processing data directly at the point of origin - without insecure connections, high latency, large energy overheads or costs due to transmission. Edge AI is therefore a pathfinder and accelerator for many new applications in areas such as autonomous driving, personalized digital assistance and intelligent service robots.

As part of the European Union's initiative "European Network of AI Excellence Centres: Expanding the European AI Lighthouse", the new network is intended to create a lighthouse within the international AI initiatives. dAI^EDGE stands for "A network of excellence for distributed, trustworthy, efficient and scalable AI at the Edge".

Under the leadership of the German Research Center for Artificial Intelligence, experts in artificial intelligence, embedded computing, microprocessors, distributed hardware and software, computer science, and engineering will work closely together to

- mobilize the AI and edge community,
- connect al-on-demand platforms, digital innovation centers, and AI and Edge projects with relevant stakeholders,
- initiate European partnerships and projects,
- provide ideas, tools, services, guidelines and trends to support the next generation of Edge AI technologies.

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The Fraunhofer Institute for Computer Graphics Research IGD is part of the project consortium and leads the pilot development in the field of smart city and autonomous robotics (e.g. for aerospace). The team of the "Virtual and Augmented Reality" department, led by Holger Graf, contributes its expertise in the implementation of the image-based software basis for neuromorphic sensing.

"Neuromorphic image sensor technology, such as that installed in event-based cameras, works asynchronously and only transmits information about the pixels in an image that have changed. It is therefore able to process very complex images and dynamic scenes at high speed - but with much less data and less power. Neuromorphic sensor technology can be used in autonomous robots, such as robotic mowers, or drones, but also cars," explains Holger Graf. Together with the German Aerospace Center (DLR) and the DFKI, the AI specialists are working within the framework of dAIEDGE on the further development of an image processing system developed at Fraunhofer IGD. This makes it possible to perform object recognition and pose estimation on downscaled neural network models (Spiking Neural Networks - SNN) designed for neuromorphic hardware. The official project start date is early September 2023.

Advanced edge AI technologies for different industries

To accelerate digital and green transformation through advanced AI technologies, applications and innovations, dAIEDGE builds on the existing assets and strengths of European industry. The main objective is to support and ensure rapid development and market adoption of distributed edge AI technologies, such as hardware, software, frameworks and tools. The applications of dAI[EDGE] are expected to be used in a wide range of fields, such as the Internet of Things (IoT), intelligent transportation systems, robotics, and healthcare. "The development of smart edge devices increases drastically their ability to make complex decisions autonomously and respond to real-time data. This is the basis for a dynamic AI ecosystem with distributed, trustworthy, efficient and scalable AI methods," says Prof. Didier Stricker, head of research lab Augmented Vision at consortium leader DFKI in Kaiserslautern.

The network has a project volume of €14.4 million, of which €10.7 million is funded by the European Union. dAI[EDGE] will work closely with major European AI initiatives such as HumanE-AI-Net, CLAIRE, ELLIS and AI4EU. To support the

PRESS RELEASE

mobility of scientists through research exchanges and to carry out industrial research projects, the Network of Excellence will support 30 projects through the publication of three open calls for a total funding of 1.8 million euros.

Partners:

Aegis Rider, Bonseyes Community Association, Blekinge Institute of Technology, Commissariat à l'Energie Atomique et aux énergies alternatives, Centre d'excellence en technologies de l'information et de la communication, Centre Suisse d'Electronique et de Microtechnique, Deutsches Forschungszentrum für Künstliche Intelligenz, Deutsches Zentrum für Luft- und Raumfahrt e.V., ETH Zürich, Fraunhofer Gesellschaft, FundingBox Accelerator SP, Foundation for Research and Technology - Hellas, Haute école spécialisée de Suisse, HIPERT SRL, imec, Institut national de recherche en informatique et automatique, INSAIT - Institute for Computer Science, Artificial Intelligence and Technology, IoT Digital Innovation Hub, Katholieke Universiteit Leuven, NVISO, SAFRAN Electronics and Defense, SINTEF AS, Sorbonne Université, CNRS, ST Microelectronics, Synopsys International Limited, Thales, Ubotica Technologies Limited, University of Castilla-La Mancha, The University of Edinburgh, University of Glasgow, University of Modena and Reggio Emilia, University of Salamanca, Varjo Technologies, VERSES Global B.V., Vicomtech

For more information:

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PRESS RELEASE

About Fraunhofer IGD

Since 1987, the Fraunhofer Institute for Computer Graphics Research IGD has been setting international standards for applied research in visual computing, the branch of computer science that deals with images and 3D models. We transform information into images as well as images into information, and we support industry and business in their strategic development. Keywords here are human-machine interaction, virtual and augmented reality, artificial intelligence, interactive simulation, modeling, 3D printing and 3D scanning. Around 180 research staff at the three sites in Darmstadt, Rostock and Kiel are generating new technological application solutions and prototypes for Industry 4.0, digital healthcare and the smart city. Our products take on international relevance through our partnership with the sister institute in Graz and Klagenfurt. Our matrix organization enables us to serve our clientele from a wide range of industries with technical and competitive services relevant to their needs. For this purpose, we have assembled cross-functional teams of experts with extensive industry experience, who also take on planning, management and evaluation responsibilities for projects of any magnitude.