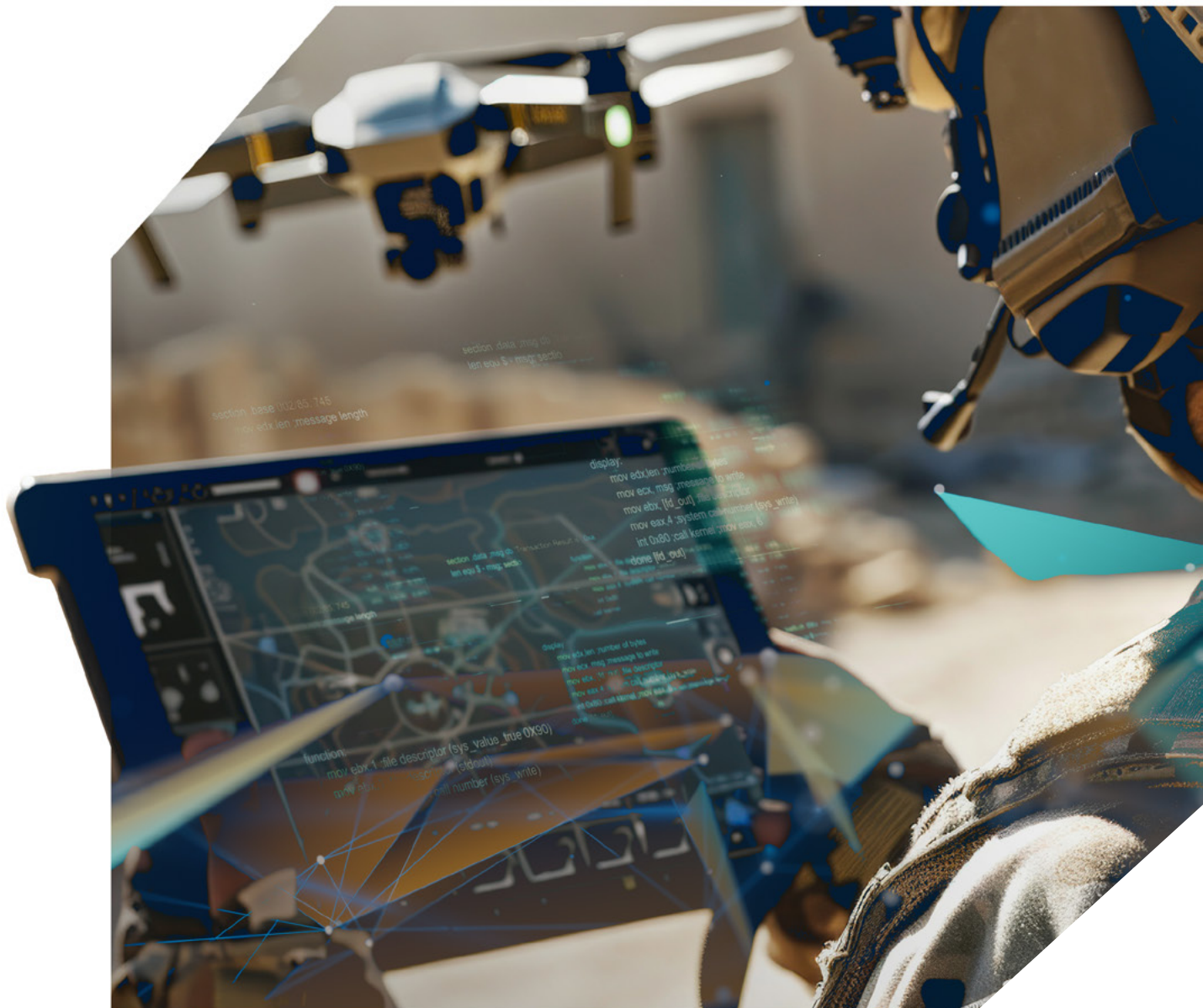



Akkodis Nordics & the Defense Industry

Connecting the Dots in Defense with **Embedded Systems and Edge AI**





While the public continues to be mesmerized by generative and conversational AI, something probably even more transformative is going on elsewhere: At the edge of the network. Edge AI is having a huge impact on the defense sector.



Our networked world is gaining strength at the edges. Computers become smaller, cheaper and more powerful, sensor technology is evolving rapidly, and enhanced connectivity is enabling lightning-fast data exchange. All this means we can now do things that a few years ago were unthinkable outside of big tech research centers.

Edge AI has arrived, and this combination of embedded devices and machine learning algorithms is creating immense new opportunities. Just look at some of the newest defense technology for the common soldier: A soldier borne compute module weighing 400 grams, so powerful it can process images from up to 5 cameras simultaneously. It can integrate input from optoelectronic devices such as night vision, thermal imaging systems, head-up displays, augmented reality glasses, and process data from vibrational sensors and microphones as well. Add to this a soldier borne radio communication module and a battery pack, and you have a sophisticated, two-legged node in the military network, harnessing the power of AI to optimize his/her mission and reduce risk.



Not limited to the soldier

However, Edge AI in defense is not limited to the individual soldier. Equipment and assets of any size, from vehicles up to warships and fighter planes utilize edge computing. For instance, the most advanced combat aircraft in existence, the F-35, can fuse sensor data with other aircraft, and share a single picture of data across planes flying in formation. Such an interlinked system provides a more complete assessment of threats and targets than a single aircraft could provide on its own.

The concept of the Digital Soldier relies on the ability to process data where it is captured. Being independent from a centralized computing system saves valuable time and can make a crucial difference in the heat of the moment.

The components of Edge AI

For Edge AI solutions to work efficiently, several components must fall into place. Edge Devices such as drones, vehicles, wearable equipment etc. must be able to process the data they receive. They share that task with Edge Servers, equipped with enough computing power to handle multiple devices. The AI Models running on the equipment must be optimized for this edge infrastructure, with its obvious limitations regarding for instance memory and power consumption. Also, strong Connectivity is required, as many Edge AI applications, although able to function in air-gapped environments, utilize fast data transfer when available. Not least, robust Cyber Security is a crucial prerequisite across the entire system.



Multi-party collaboration needed

Building such complex and multi-layered Edge AI solutions often requires multi-party collaboration. Large manufacturers of military equipment with long and well-established track records as providers to the defense sector can cooperate with for instance engineering development companies with expertise in adjacent areas, such as industrial automation, automotive or oil & gas. The IoT technologies developed for these domains provide a solid foundation for adaption to the specific requirements of defense. Furthermore, smaller companies with niche expertise in for instance machine learning or computer vision algorithms can contribute with their expert knowledge to develop the defense Edge AI applications of tomorrow.



Computers and communication

The expertise Akkodis Nordics brings to the table is centered around connectivity and edge computing. Its engineers have developed edge computing platforms, designed to improve performance for applications such as industrial automation, autonomous driving, and edge AI, and enable increased performance efficiency through additional GPU, vision, motion and I/O cards. They come in ruggedized versions, designed to cope with the extreme demands of defense. Also, there are ultra rugged portable and vehicle mounted nodes for tactical communication, routers, and tablets for the handling of drones and cameras, built to survive the harshest environments.



The AI piece of the puzzle

Akkodis Nordics offers a whole other piece of the Edge AI puzzle. Its software developers are specialized in optimizing AI models to perform customer-defined tasks.

For instance, in Sweden, Malmö, we have helped a large company, manufacturing camera systems for home security, optimize its computer vision software with AI, to prevent false alarms.

Also, we have designed and implemented a decision support tool for improved allocation of delivery capacity. Experiencing issues managing the stocks, involving either storage or goods shortage, the client needed a tool for visualization of the current situation in terms of stock and storage space. Neodev developed an AI-powered solution, also including forecasts and prediction models to highlight upcoming problem spots.

Both these examples can be adapted to either military surveillance or military logistics.

From data to decision

As the demand for defense technology is growing and the technological potential of Edge AI is increasing as well, Akkodis Nordics is ready to contribute its expertise to innovative solutions harnessing the power of the network edge.

AI at the data's source is a powerful tool, waiting to be developed and refined. In defense, Edge AI is a bridge reaching all the way from command & control centers to the frontline fighter - a bridge that shortens the way from data to decision.

We are ready to build solutions that were unthinkable just a few years ago, harnessing the strength our networked world is gaining at the edges.



Engineering a Smarter Future Together.



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