Tattile Achieves Vision of Future With Xilinx Adaptive Platform

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Xilinx Zynq® UltraScale™ + MPSoC Machine Learning Solution Helps Tatille Achieve Higher Object Detection and Classification Accuracy in Traffic Cameras

AT A GLANCE:

Tattile develops and produces AI-based cameras for mobility applications and industrial vision systems. Its new traffic platform focuses on mobile applications with machine-learning capabilities, and smart cities applications. These include tools for free flow tolling, vehicle tracking, vehicle classification and public security applications.

Industry: ITS – Smart Cities
Head Office: Mairano, Italy
Established: 1988
Website: https://www.tattile.com/

CHALLENGE:

Tattile was looking to build a new platform that included real-time machine-learning inference to achieve high-precision car plate detection in all its new systems. The company needed a power-efficient, high-performance and highly integrated solution from a partner with a solid development tool chain and support track record.

SOLUTION:

Tattile chose a Xilinx Zynq® UltraScale™+ MPSoC and DPU solution due to its superior multi-class object detection performance, lower end-to-end latency, and below-10W power budget.

RESULTS:

With cutting-edge technology and developer tools from Xilinx, and technical support from distribution partner, Avnet Silica, Tattile built a competitive machine learning platform for a wide range of traffic camera products to enable multiple applications.

CHALLENGE:

Machine learning (ML) technology is enhancing detection accuracy and data analytics in the transportation sector. Although the technology is relatively new, it is constantly evolving, and ML is becoming the new standard. Smart traffic cameras are used for toll collection, traffic monitoring, security, and more. These systems are revolutionary because they can affect traffic flow and ease crowding and congestion at a fraction of the cost of building alternate routes and roads.

Since 1988, Tattile has been developing and producing AI (Artificial Intelligence)-based ANPR (Automatic Number Plate Reading) cameras for mobility applications. The company offers a wide range of smart cameras that are used for tolling, vehicle tracking, vehicle classification, and public security applications. For its newest range of cameras, Tattile chose a Xilinx Zynq-UltraScale+ XCZU5EV and DPU solution to replace current camera designs. The new cameras will be future-proof to accommodate new AI algorithms and image sensors. They are designed for a series of products from low-end to very high-end and will operate in outdoor environments which is a challenge for power dissipation and system reliability.

SOLUTION:

The Xilinx Zynq UltraScale+ MPSoC and DPU solution offers great scalability, flexibility, and industral-grade relablity to address the design challenges that Tattile was facing. Tattile designed Xilinx's machine-learning technology into its new cameras because it helps them to achieve higher levels of object detection, classification accuracy, and inferencing efficiency in complex environments, compared to traditional computer vision based solutions. Machine learning requires significant computing horsepower for real-time inference within a limited power budget. The Xilinx solution supports those needs while capably addressing Tattile's rigorous design goals, with the adaptability to enable further performance improvements in the field over time.

Another reason Tattile chose Xilinx was for Vitis™ AI, a software environment dedicated to AI application development. Not only does Vitis AI deliver outstanding AI acceleration performance, but it also provides the flexibility to fit various traffic scenarios for Tattile products. With the powerful Vitis AI tools, Tattile is able to implement its customized, deep-learning neural network for object detection and classification and run H.265 video codec processes in a single-chip, MPSoC solution. Additionally, the Xilinx solution offers a power-consumption advantage, the right price, and a strong, supportive team that is helping to foster business success.

RESULTS:

Tattile's machine-learning platform enables multiple applications including traffic monitoring, license plate reading, mobile monitoring in trains and police cars, and vehicle type identification for tolling and vehicle tracking.

Xilinx's AI solution is scalable enough to meet the full line of Tattile's products from low-end to high-end, and is favorable to reduce the total cost-of-ownership of Tattile's products by delivering superior AI performance while keeping power consumption low. With Xilinx Zynq UltraScale+ MPSoC and Vitis AI on its side, Tattile is able to seize the future today by offering state-of-the-art solutions now that are scalable to meet tomorrow's needs.