# **Group III**

# **TASK 09**

**Problem Statement**:Identify the solution available for FPGA development using AI. Make a survey report

The integration of AI with FPGA development tools serves several important purposes, primarily aimed at leveraging the strengths of FPGA technology to enhance AI applications such as Parallel Processing, Customizable Hardware, Real-Time Processing, Scalability, Time management, Integration with Existing Infrastructure.

For the ease of doing the FPGA programming, the face of the Global market for semiconductors is shifting into AI integration with the design tools.The major participants include EDA Tool providers and fabless manufacturers where the involvement is seen drastically. Some of the solutions available includes optimised FPGA acceleration of AI workloads, model quantization, optimization using AI etc.

Market Survey using AI in different platforms of Global competitors.

#### **1. Intel FPGA Platforms**

* **Intel oneAPI Toolkits**: These toolkits include support for FPGAs through Intel's Open Programmable Acceleration Engine (OPAE). They provide development frameworks and libraries optimized for FPGA acceleration of AI workloads.
* **Inte Quartus Prime**: A comprehensive FPGA development environment that supports AI inference and training acceleration through platforms like Intel® Agilex™ and Stratix® FPGAs.

#### **2. Xilinx FPGA Platforms**

* **Vitis AI**: Xilinx provides the Vitis AI development stack, which includes support for deploying AI models on Xilinx FPGAs. It includes tools for model quantization, optimization, and deployment on devices like the Xilinx Alveo™ accelerator cards.
* **Vivado Design Suite**: Xilinx's comprehensive development environment for FPGA design, which includes tools and libraries for integrating AI acceleration into FPGA-based systems.

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#### **3. NVIDIA**

* **NVIDIA EGX Platform**: While primarily focused on GPUs, NVIDIA also supports AI inference on FPGAs through their platforms, leveraging tools like NVIDIA Triton™ Inference Server for deployment.

#### **4. Other Tools and Frameworks**

* **Caffeine**: A framework designed specifically for FPGA acceleration of deep learning models, offering optimizations for performance and power efficiency.
* **SambaNova**: Provides AI-driven solutions that include FPGA acceleration for training and inference tasks.