

## GPU Cores and CUDA - Understanding Parallel Processing

**CUDA:** NVIDIA's parallel computing platform (launched 2007)

### GPU Architecture Hierarchy

GPU

Graphics Processing Unit



SMs

Streaming Multiprocessors

### Example

**RTX 4090**

Streaming Multiprocessors  
**128 SMs**

CUDA Cores

Cores

CUDA Cores

16,384 cores

### SIMT Execution

Single Instruction, Multiple Threads model for parallel processing

### Automatic Integration

PyTorch/TensorFlow automatically leverage CUDA kernels

**PyTorch & TensorFlow automatically leverage CUDA for GPU acceleration**