Report on CUDA libraries

There are different libraries in NVIDIA CUDA:

1. **Math Libraries**: It is used to compute intensive applications in areas such as computational chemistry, medical imaging.
    - cuBLAS: GPU-accelerated basic linear algebra (BLAS) library
    - cuFFT: GPU-accelerated library for Fast Fourier Transforms
    - CUDA Math Library: GPU-accelerated standard mathematical function library
    - cuRAND: GPU-accelerated random number generation (RNG)
    - cuSOLVER: GPU-accelerated dense and sparse direct solvers
    - cuSPARSE: GPU-accelerated BLAS for sparse matrices
    - cuTENSOR: GPU-accelerated tensor linear algebra library
    - AmgX: GPU-accelerated linear solvers for simulations and implicit unstructured methods

2. **Parallel Algorithm Libraries**: Libraries of highly efficient parallel algorithms for several operations in C++ and for use with graphs when studying relationships in natural sciences.
    - Thrust: Library of C++ parallel algorithms and data structures

3. **Image and Video Libraries**: It is used for image and video decoding, encoding, and processing that leverage CUDA and specialized hardware components of GPUs.
    - nvJPEG: GPU-accelerated library for JPEG decoding
    - NVIDIA Performance Primitives: It is used to provide image, video, and signal processing functions
    - NVIDIA Video Codec SDK: It is used for hardware-accelerated video encode and decode on Windows and Linux
    - NVIDIA Optical Flow SDK: It is used for computing the relative motion of pixels between images

4. **Communication Libraries**:
    - NVSHMEM: It is used for GPU memory, with extensions for improved performance on GPUs
    - NCCL: It used for fast multi-GPU, multi-node communications that maximizes bandwidth while maintaining low latency

5. **Deep Learning Libraries**: It is used for Deep Learning applications that leverage CUDA and specialized hardware components of GPUs.
    - NVIDIA cuDNN: It is used for deep neural networks
    - NVIDIA TensorRT: It is used for high-performance deep learning inference optimizer and runtime for production deployment
    - NVIDIA Jarvis: It is used for developing engaging and contextual AI-powered conversation apps
    - NVIDIA DeepStream SDK: It is used for AI-based video understanding and multi-sensor processing
    - NVIDIA DALI: It is used for decoding and augmenting images and videos to accelerate deep learning applications

6. **Partner Libraries**:
    - OpenCV: It is used for computer vision, image processing, and machine learning, supporting real-time operation
    - FFmpeg: It is used for audio and video processing with a library of plugins
    - ArrayFire: for matrix, signal, and image processing
    - MAGMA: for heterogeneous architectures, by Magma
    - Gunrock: It is used for graph-processing designed specifically for the GPU
    - CHOLMOD: for sparse direct solvers, included in the SuiteSparse linear algebra package
    - CUVIlib: for accelerating imaging applications from medical, industrial, and defense domains