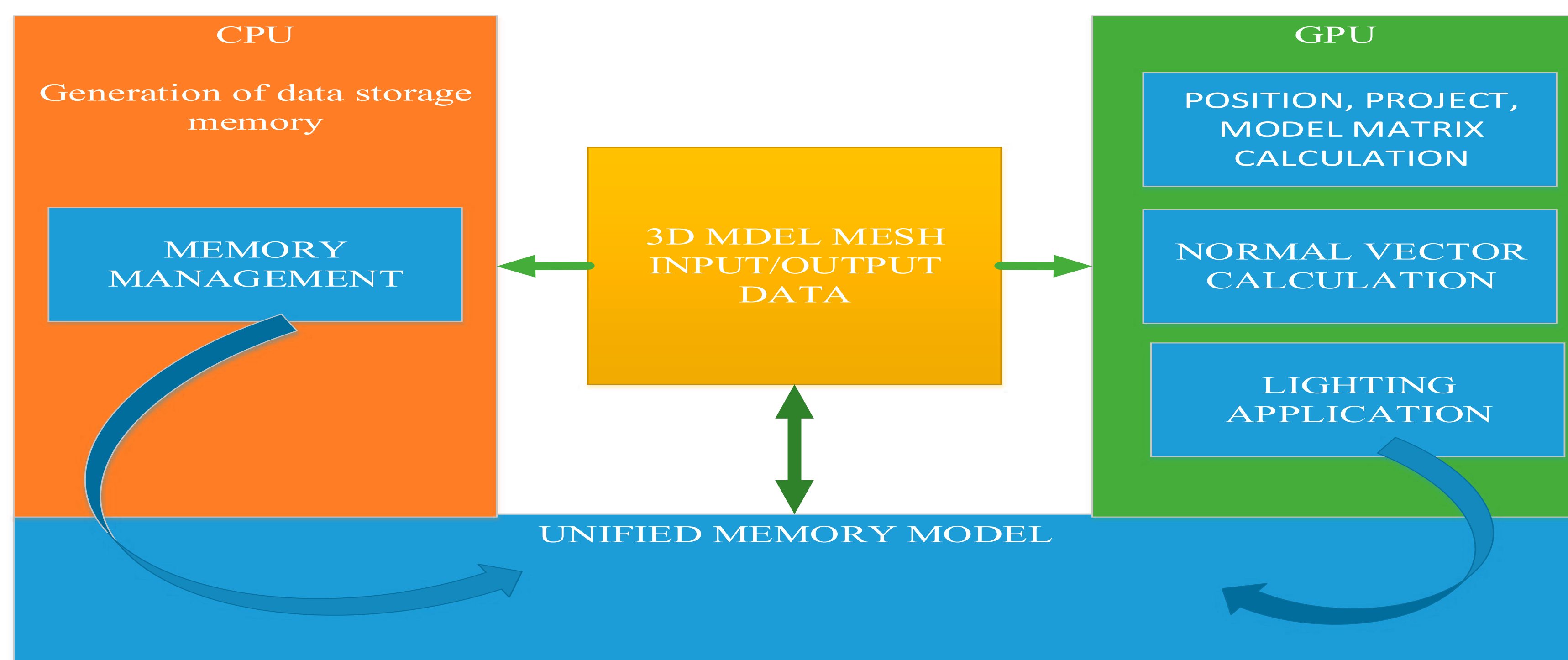


Neural network 3D reconstruction from Point clouds models for CAD systems using

P. Sheetekela, Ph.D

Department of Intelligent Information Systems and Technologies, Moscow Institute of Physics and Technology (State University)
Moscow, Tel: +79152287497, +264817329174

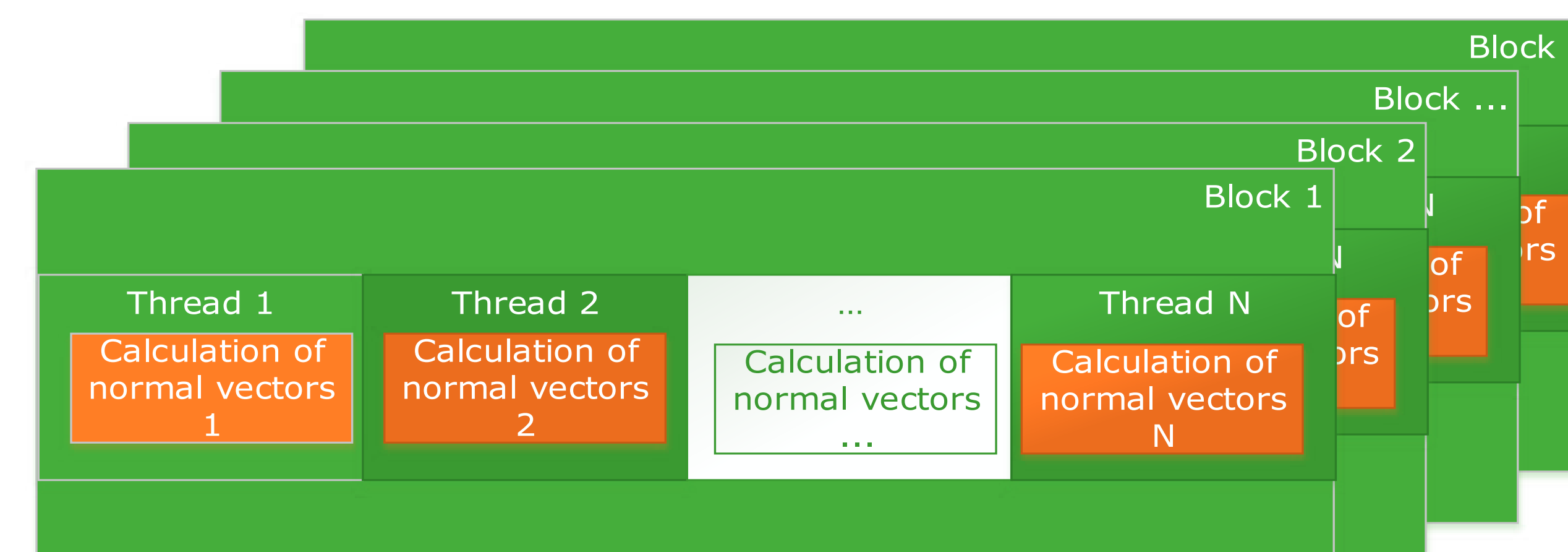
The use of Neural network algorithms to reconstruct 3D models from point clouds, model generation from raw laser-scanned data, image-based 3D reconstruction, mesh repair and un-orientated and non-uniform Data set model for use in CAD system applications. GPU CUDA technology techniques to do massive calculation for real-time 3D reconstruction and visualization.



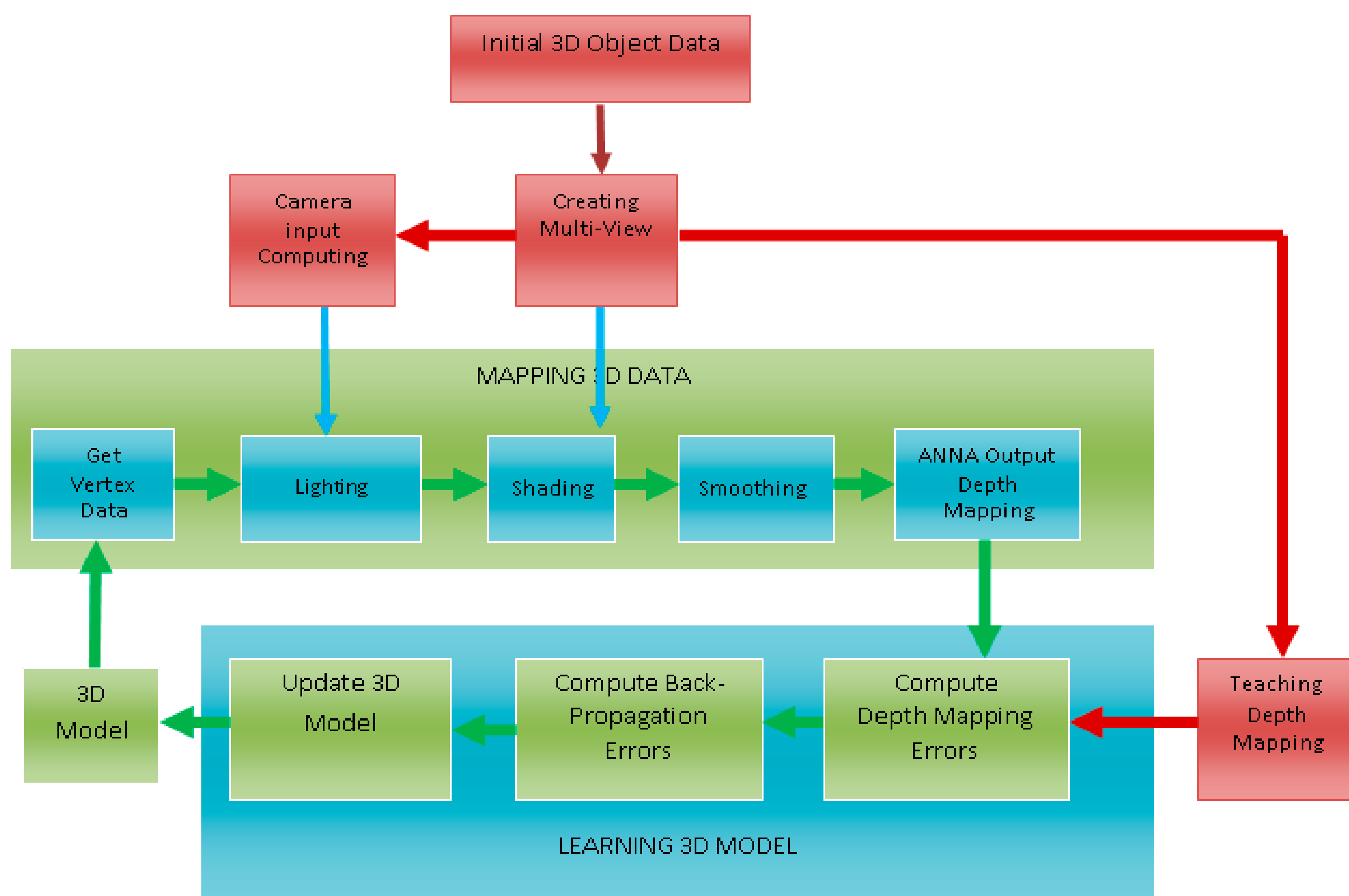
Data management and processing

Abstract

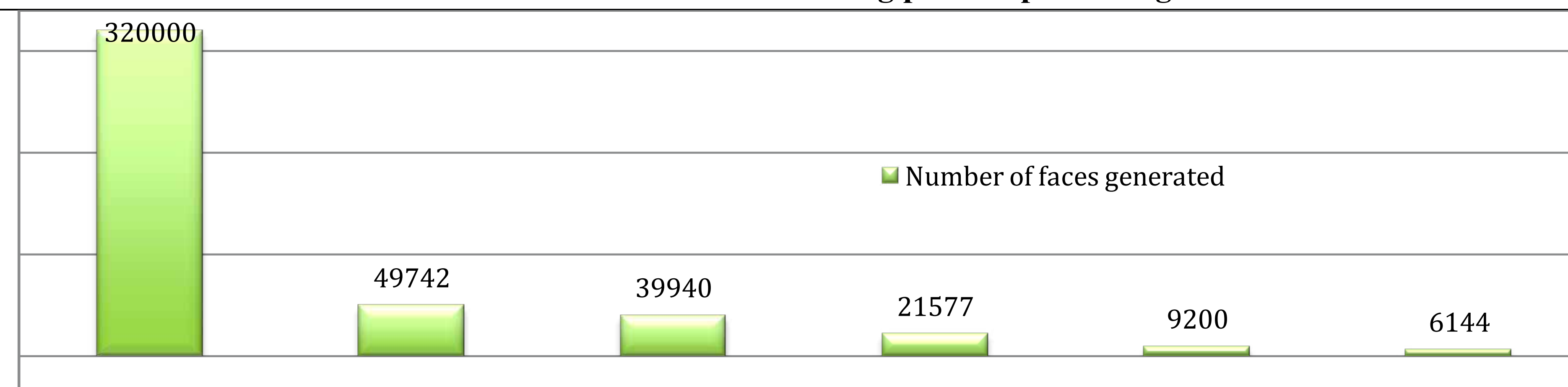
We propose a method based on artificial neural network algorithms (ANNA) for reconstructing virtual 3D objects of the real world obtained from laser scanners, modeling application for recognition, reconstructing and analysis in most CAD Systems applications. Currently 3D representation requirements to the realism of the virtual 3D model and fast data processing are very high. Our method uses ANNA for smart reconstruction and repair of volumetric model from irregular point clouds, un-orientated and non-uniform 3D data representation. As our method and data featured mapping fits the new Nvidia GPU architecture for massive parallel calculation, we use CUDA technology in our application for data management and to acquire high performance as results shows.



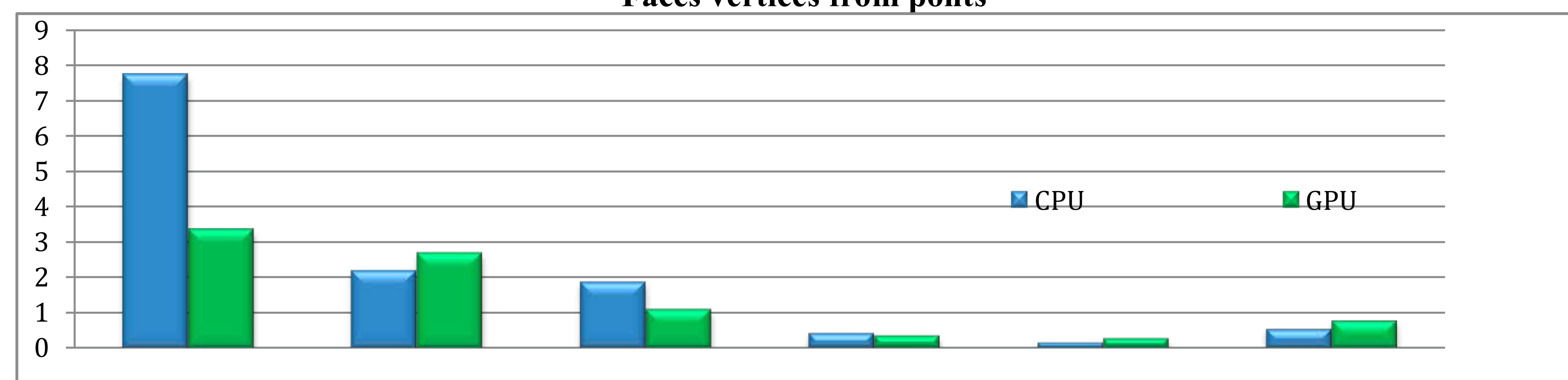
Normal vector calculation using parallel processing



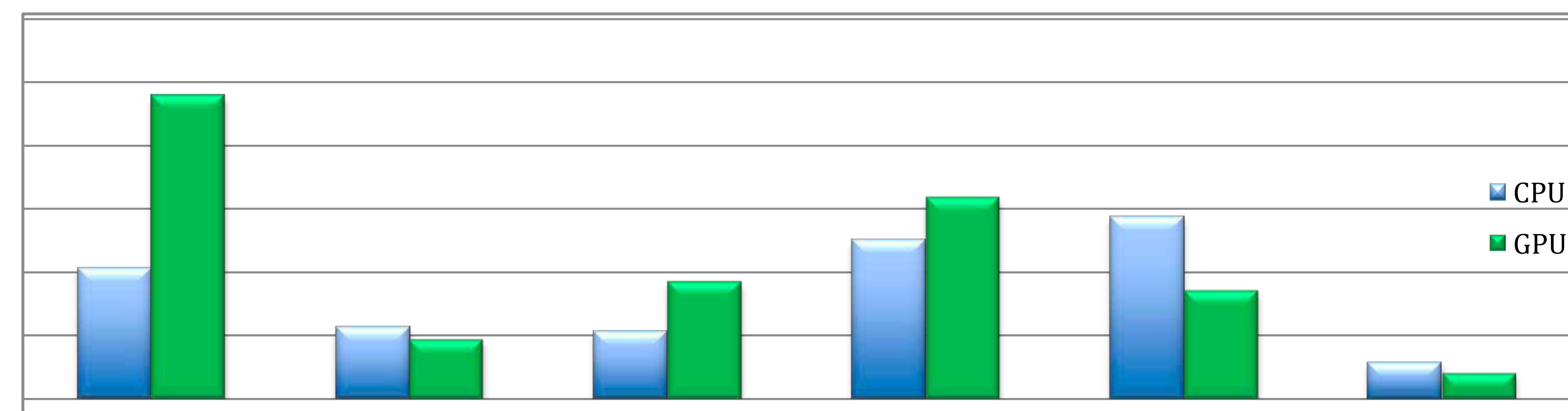
Artificial Neural Network Algorithms



Faces vertices from ponts



Processing Time in Sec



Performance of CUDA based ANNA compared to serial CPU code