EC Dept.,L.D.College of Engg.,Ahmedabad

Report on Seminar Lecture on MATLAB in VLSI By Experts from Mathworks,Pune

(31-1-2020,Friday,11-2 pm)

The seminars by Experts from Mathworks ,Pune was organized in the department. The experts were :
1.Shri Pwan Fakatkar, Mathworks ,Pune

The experts are having vast experience in the field of MATLAB software .

The major topics of the seminar are mentioned below:

Image processing with MATLAB
Getting started with Machine Learning
Embedded system deployment with Model-Based Design

The major points of the seminar mentioned below:

Deep Learning Toolbox™ (formerly Neural Network Toolbox™) provides a framework for designing and implementing deep neural networks with algorithms, pretrained models, and apps. You can use convolutional neural networks (ConvNets, CNNs) and long short-term memory (LSTM) networks to perform classification and regression on image, time-series, and text data. You can build advanced network architectures such as generative adversarial networks (GANs) and Siamese networks using custom training loops, shared weights, and automatic differentiation. Apps and plots help you visualize activations, edit and analyze network architectures, and monitor training progress.

We can exchange models with TensorFlow™ and PyTorch through the ONNX™ format and import models from TensorFlow-Keras and Caffe. The toolbox supports transfer learning with a library of pretrained models (including NASNet, SqueezeNet, Inception-v3, and ResNet-101).

We can speed up training on a single- or multiple-GPU workstation (with Parallel Computing Toolbox™), or scale up to clusters and clouds, including NVIDIA GPU Cloud DGX systems and Amazon EC2® GPU instances (with MATLAB® Parallel Server™).

With the push of a button, you can use MATLAB® and Simulink® to generate code and run it on hardware. However, coding is just one task – learn how you can use MATLAB and Simulink to design, code, and verify your next embedded system from prototyping to production.

We can:

Generate optimized C, C++, CUDA, Verilog, VHDL, and Structured Text
Use floating- and fixed-point design tools to make cost vs. performance tradeoffs
Verify and profile generated code using in-the-loop testing

Comply with standards such as AUTOSAR, ISO 26262, DO-178, MISRA C, and CERT C

Prototype on popular boards from Arduino® to Zynq® using hardware support package add-ons

Image Processing Toolbox™ provides a comprehensive set of reference-standard algorithms and workflow apps for image processing, analysis, visualization, and algorithm development. You can perform image segmentation, image enhancement, noise reduction, geometric transformations, image registration, and 3D image processing.

Image Processing Toolbox apps let you automate common image processing workflows. You can interactively segment image data, compare image registration techniques, and batch-process large data sets. Visualization functions and apps let you explore images, 3D volumes, and videos; adjust contrast; create histograms; and manipulate regions of interest (ROIs).

We can accelerate your algorithms by running them on multicore processors and GPUs. Many toolbox functions support C/C++ code generation for desktop prototyping and embedded vision system deployment.

The participant students and the faculties got good knowledge about MATLAB.

The seminar was coordinated by Prof.Arun Nandurbarkar.

The department is thankful to M.V.Shah,Head of the Department for encouraging to arrange this expert lecture. The department is also thankful to the Principal Dr. R.K.Gajjar for giving permission to organize the expert lecture.

<u>Glimpses:</u>