Basaveshwar Engineering College, Bagalkot

Department of Computer Applications (M.C.A)

Course: MCA

Semester: II

<u>**Seminar Topic**</u>**: TensorFlow**

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1. Introduction

TensorFlow is a leading open-source platform for end-to-end machine learning developed by Google. It simplifies model development, training, and deployment across CPUs, GPUs, and even mobile devices. Known for its robustness in deep learning tasks, TensorFlow—with its high-level Keras API—enables rapid prototyping of models ranging from simple neural nets to cutting-edge vision and NLP applications. This seminar explores TensorFlow's architecture, core components, and real-world applications, especially within the Python ecosystem.

2. Seminar Topic Details

Field	Details
Title of the Topic	Pre-trained Models for Image Recognition in Python
Area	Artificial Intelligence (AI), Machine Learning (ML), Deep Learning (DL), Computer Vision (CV)
Keywords	Pre-trained Models,Image Recognition,Deep Learning

3. Topic Summary

TensorFlow serves as the foundation for many real-world AI applications. With modules like tf.keras.applications, developers can tap into pre-trained models for transfer learning, drastically reducing the need for massive datasets or hardware resources. TensorFlow supports dynamic computation (via eager execution), custom model creation, visualization (via TensorBoard), and deployment via TensorFlow Lite and TensorFlow.js.

The seminar includes a practical overview of:

- Building a simple image classifier using TensorFlow.

- Understanding layers, optimizers, and activation functions.

- Leveraging pre-trained models like MobileNetV2 for quick experimentation.

4. Relevance to MCA Curriculum

TensorFlow strengthens essential AI/ML skills emphasized in the MCA curriculum:

- Empowers students to build intelligent systems.

- Bridges theoretical learning with real-world coding experience.

- Prepares learners for careers in software engineering, data science, and AI product development.

5. Learning Objectives

By the end of the seminar, attendees will be able to:
- **Understand TensorFlow's role in AI/ML development.**
- **Identify TensorFlow's components: tensors, graphs, sessions (legacy), and Keras APIs.**
- **Use pre-trained models with transfer learning for computer vision.**
- **Train, evaluate, and deploy a basic image classification model.**
- **Navigate TensorFlow Hub and TensorBoard.**

6. Expected Outcome

The expected outcomes of this seminar report are for the audience to gain a comprehensive understanding of how pre-trained models are revolutionizing image recognition, particularly within the Python ecosystem.

In summary, the audience should:

By the end of the seminar, attendees will be able to:

- Understand TensorFlow's role in AI/ML development.

- Identify TensorFlow's components: tensors, graphs, sessions (legacy), and Keras

APIs.

- Use pre-trained models with transfer learning for computer vision.

- Train, evaluate, and deploy a basic image classification model.

- Navigate TensorFlow Hub and TensorBoard.

7. References

1. **Abadi et al., "TensorFlow: Large-Scale Machine Learning on Heterogeneous Systems." tensorflow.org**

2. **Chollet et al., "Keras." github.com/keras-team**

3. **TensorFlow Hub. tfhub.dev**
4. **TensorFlow Tutorials.**

8. Signatures

Co-ordinator Signature: _____

HOD Signature: _____