Experiment 01 ~ Review of Deep Learning Techniques and Applications.

Aim

To review and understand key deep learning techniques and their applications, focusing on popular frameworks Keras and PyTorch, and the Transformer architecture used for advanced sequence modeling.

Description

Keras:
 Keras is a high-level neural networks API, written in Python and capable of running on top of TensorFlow. It simplifies building, training, and deploying deep learning models by providing an easy-to-use, modular interface. Keras is widely used for quick prototyping and supports convolutional, recurrent, and fully connected networks.

PyTorch:
 PyTorch is a flexible, open-source deep learning framework that offers dynamic computation graphs and an intuitive programming model. It is preferred for research and complex model development due to its fine-grained control and extensive support for GPU acceleration. PyTorch facilitates seamless model debugging and customization.

Transformers:
 Transformers are a deep learning model architecture that uses self-attention mechanisms to handle sequential data without relying on recurrent layers. They have transformed natural language processing tasks by enabling parallel computation and better context capture, powering models like BERT and GPT.

Conclusion

Keras, PyTorch, and Transformer architectures each play a vital role in advancing deep learning. Keras offers simplicity and rapid prototyping, PyTorch provides flexibility and control for research, and Transformers have revolutionized sequence modeling with their powerful self-attention mechanism. Together, they form a strong foundation for developing state-of-the-art deep learning applications across various domains.