Title:

How Deep CNN and Transformer Solve Machine Learning Problems of Traditional ANN

Abstract:

The powerfulness of machine learning was already proven more than 30 years ago in the boom of neural networks but its successful application to the real world is just in recent 10 years after the deep convolutional neural networks (CNN) have been developed. This is because the machine learning alone can only solve problems in the training data but the system is designed for the unknown data outside of the training set. This gap can be bridged by regularization: human knowledge guidance or interference to the machine learning. This speech will analyze these concepts and ideas from traditional neural networks such as MLP to the deep convolutional neural networks (CNN) and Transformer. It will answer the questions why the traditional neural networks fail to solve real world problems even after more than 30 years' intensive research and development and how the deep CNN and Transformer neural networks solve the problems of the traditional neural networks and now are very successful in solving various real world AI problems.