Research Proposal

Machine learning concepts helped the researchers to bridge the gap between human thinking and machines' ability. Deep learning is derived from machine learning to reduce the gap in much faster and smarter way using powerful computing architectures such as multi-core and Graphics Processing Units (GPU). Deep learning architectures basically consist of different layers of computational nodes, each having a goal to learn or extract features. Extracting and processing useful features from high dimensional input space requires clear attention at every layer of the preferred model. Typical design cycle of any deep learning application requires domain knowledge and that includes collecting data, preprocessing, representation learning, training and evaluation phases. It is important to understand that of all steps mentioned, it is the representation learning that makes life easier as it extracts useful information from the hidden units. At the same time, some applications require manifold learning, instead of representation learning, which will uncover different features. Handling high dimensional and multimodal data with basic building operations such as convolution, correlation, gradient descent, pooling require clear insight. Though deep learning is applied widely in other areas, it still requires more to disentangle useful features in multimodal environment. Typical design cycle of any deep learning application requires domain knowledge and that includes collecting data, preprocessing, representation learning, training and evaluation phases. It is important to understand that of all steps mentioned, it is the representation learning that makes life easier as it extracts useful information from the hidden units. In recent years visual processing has gained more attention owing to its application in mobile and hand held devices and people demand for that. Though deep learning is applied widely in other areas, it still requires more to disentangle useful features in multimodal environment. Automatic caption generation on video stream with synchronization is one such research challenge that will require effective hybrid model to address.