Predicting the Robustness of Real-World Complex Networks

ABSTRACT

Real-world networked systems can be abstracted and studied as complex networks. As random failures and malicious attacks can seriously destroy the structure of complex networks, it is critical to ensure their robustness and maintain the functions. Deep learning offers a quick approach to predict network robustness performance while calculating the robustness of large-scale real-world networks is typically time-consuming. In this study, the Real-RP multi-convolutional neural network (CNN) approach is used to forecast the robustness of complex real-world networks. This paper focuses on predicting robustness of 521 real-world networks. Unknown real-world networks are first divided into known network categories, and then their resilience performance is predicted using the understanding of the particular network category learned using a sizable number of artificial networks. And experiment results 528 show that the real-world networks were classified in a more 529 suitable category and performs better at predicting results.

Reference : https://ieeexplore.ieee.org/document/9875263

Deep Neural Networks for Action Recognition Using Skeleton-Based Attentions and Capsule Networks

ABSTRACT

This work develops Deep Neural Networks (DNNs) by adopting Capsule Networks (CapsNets) and spatiotemporal skeleton-based attention to effectively recognize subject actions from abundant spatial and temporal contexts of videos. The proposed generic DNN includes four 3D_CNNs, AJA and AJM generation layers, two reduction layers, two A_RNNs, and a classifier using the feedforward neural layer. A_RNNs generate attention weights over time steps to highlight rich temporal contexts. To integrate CapsNets in this generic DNN, three types of CapsNet-based DNNs are devised, where the CapsNets take over a classifier, A_RNN+classifier, and RL+A_RNN+classifier. The experimental results reveal that the proposed DNN using CapsNet as an inference classifier outperforms the other two CapsNet-based DNNs and the generic DNN adopting the feedforward neural network as an inference classifier.

Reference : https://ieeexplore.ieee.org/document/931203

Building a Natural Language Query and Control Interface for IOT Platforms

ABSTRACT

Internet of things is a trending keyword in the field of technology. The Internet of Things is actually a pretty simple concept, and it means taking all the things in the world and connecting them to the internet. Hence, in the fast-moving pace of digitization, enterprises are investing a lot of time and effort to dive into this wave ranging from industry to industry. The growth in the use of IoT devices is changing the lifestyle, personal health, habits, environment, and industries across different sectors. Many researchers have attempted to build natural language interfaces for IoT platforms, but have not produced much progress in parsing natural language commands that contain multiple operations and more complex logical structures. In this paper, we propose IoT-NLI, a natural language query and control interface for popular IoT platforms, which uses hierarchical semantic parsing algorithms and directed edge-tagged graph structures to efficiently parse natural language commands input by users, enabling them to perform multiple operations contained in one complex natural language command.

Reference : https://ieeexplore.ieee.org/document/9808139