Abstract 1(2022-10-01)
Visual Dubbing Pipeline using Two-Pass Identity Transfer
Speaker : Dhyey Devendrakumar Patel

Dubbing is more popular in filmmaking to gain good quality of dialogue. In this seminar, initially speaker talks about the traditional and visual dubbing. he further discussed that traditional dubbing needs to such that it should matches with original actor. In the video example, speaker showed example of how dubbing took place where original video was spoken on French and dubbed into the English language, but the dubbing is fully synchronized with the dubbing language. Such kind of things reduce the user experience. Secondly speaker talked about the advantage of visual dubbing by comparing with traditional dubbing. He discussed that visual dubbing could correct the lip motion to match the audio also it makes easier the translator task. He further discussed about the automatic dubbing pipeline for industrial application, but it has some challenges like small dataset especially for TV advertisement, mouth expression should be same and maintain quality of original video. He further discussed and classified he visual dubbing into the parts first is audio based and expression bases. Next speaker discusses about how dubbing takes place. For example, actor A is speaking language B and dubber D dubs in language C so it should be converted to actor a speaks language C, but it consists of 6 important parameters like pose, identity, expression of mouth and face, background, and resolution (high or low).

Speaker discussed about the smoothing and skin color conversion which helps that dubbing looks more realistic. He described about how transfer network will help for visual dubbing which has set and corridor. It has shared encoder and GAN module and two dubber one for actor and one for dubber

In final stage, speaker has separately all the remaining parameter where composite of expression takes place. Now speaker described about over smoothness of the video which he needed to overcome for maintain the quality of the video. He did with the help of spatio-temporal stabilization which helped him to maintain the temporary smoothness of the video. Speaker discussed about the facial landmark to create the binary mouth mask. He had edited the face mask of original actor video and composting the expression of actor frame and synthesised expression which led to get the result.

At last, speaker had compared different method with his method like FOMM, Wav2Lip and Ours.

Where he described the head posture how position of head is different in all the videos. Also he shared the quantitative metric to measure lip sync quality (lower is better) and visual quality (results indicates lower is better). Lastly, speaker invited 28 participants to evaluate his results where he showed traditional and visual dubbing and asked three questions to participants. 86% people found that lips are synchronized with the audio, 61 to 80 says visual quality is good. Some

Limitation are double chin issue, inconsistent nasolabial fold, and improper intensity of expression.

Speaker discussed that in future enhancement he will be going to solve the double chin issue and additional control channel for expression intensity.

Abstract 2 (2022-10-10)
Anomaly Detection in IOT Devices using LogBERT
Speaker: Eniela Vela

Speaker discussed about the IOT devices usage across globe. According to her analysis, around 20 % of the companies using IOT devices have reported an cyberattack in 2020. Also, in 2022, it reaches to approximately 10 billion and projected that it will reach around 30 billion in 2030. She describes how machine learning helps to provide security in IOT devices. For example, Firstly, speaker discussed that K-nearest neighbor (KNN) has achieved 84.82% compared to decision tree (81.05%). Secondly, SVM performed 100% accuracy using blackhole and sinkhole attacks. Further she discussed about the unsupervised machine algorithm LogBert which has very good result on three different datasets like Hadoop, BlueGene and thunderbird. She described three question that relevant to her research like can logBERT usage can be extended in IOT device anomaly detection, the performance of the algorithm and measures of indication on anomaly detection.

Further speaker discussed about the anomaly detection with the example where she took an example of dataset and explained value student is different from values that are present in the dataset. LogBERT is equal to LogParser + BERT where LogParser contains drain (extract log templates and automatically split them into the group) and spell (find matches across different logs) and BERT contains masked language modeling (MLM - that predicts original value from the context) and next sentence prediction (NSP – recognizes the second sentences in a pair of sentences in the following sentences in the original documents). LogBert using masked log key predication and volume of hypersphere minimization.

Further speakers describe about the data generation where she took data from different routers. The routers have indoor and outdoor camera, smart lightbulb, and DVR. All the attacks were performed in the virtual box and Arduino to check the electric current, Wireshark to get the network traffic data. She discussed about the usage of three malware for data generation. Moreover, she discussed about the logBERT how it will understand the patterns like normal or abnormal. She generated over 9 million data set. Further, she described about the data analysis and for this experiment she used network traffic data. For data cleaning, she removed all the missing data from the dataset. She did the grouping based on the same source and destination IP and protocol. For the visualization, speaker created the UML diagram to better understand the work or process flow.

Further speaker described about the mini set to the test the balances of data which had result into 70% normal and 30% abnormal. The algorithm was trained in normal dataset and F1- score is 55.56%. Also, train loss and valid loss described in the line graph. Another mini dataset speaker took 90% normal and 10% abnormal and F1- score was 75.5%. Afterwards she took the comparison of computer devices and logBERT where indoor camera had the best results. For three IOT devices logBERT had better result and other three had logCluster had better result. Further, speaker calculated the energy consumption and found that when attacks happened energy consumption is twice as normal state.

For future work, speaker suggested she will be improving logBERT algorithm data features, incorporate evaluation for machine leaning and evaluate performance of logBERT in high data.

Generally, it is hard network management entities to keep the pace of the growing infrastructure. In the early 2000s, IBM introduced the concept of autonomous system which achieve self-management. In this seminar, speaker talked about the network introduced by NMR G and anima.

The NGR G focused on achieving self-management, self-organizing, self-healing, self-protecting, and self -optimizing network. The focus on to reduce the influence of human administrative element in network management. Topology discovery is the process of collecting and processing the information of the node across the network. Topology discovery is costly task and consumes a lot of time. Not all the topology networks are compatible with autonomous network. The speaker talked about the thesis goal that he will be evaluating the methods are suitable for autonomous network and will be reducing the number of messages that are exchanged. Further speaker talked about autonomous network in terms with global view where he talked about the layered structure. So, in Application network infrastructure (ANI), there were multiple Autonomic control plane (ACP) which have multiple Autonomic service agent (ASA) and node. Moreover, he discussed about the from node POV scenario. There are some protocols to support the goals and ideas by NMR G like Grasp protocol. Further speaker talked about the security inside the network and that can be achieved with BRSKI. In BRSKI, there is pledge device, MASA authorising signing authority. Two ways to created design of topology discovery like distributed topology discovery and centralised topology discovery. For distributing approach, generally clustering method is used. Speaker then discussed about the clustering methods like one-hop. In clustering approach, in the beginning all nodes are weighted exchange phase. It will talk to its neighbour actually to exchange the weights.

Speaker compared result of distributed methods where he found that if all the nodes inside the network start with exact same time, then there is no knowledge of neighbour. At last , he talked about the maintenance where he discussed about the push model, neighbour observation, two cluster heads, and roles of the nodes is an important factor in maintenance. For his future work, speaker talked about that he will be optimizing the clustering by selecting better local cluster heads and letting registrar take care of clustering.