A SURVEY ON KNOWLEDGE-ENHANCED MOBILE VIDEO BROADCASTING (KVM-CAST) FRAMEWORK WITH CLOUD SUPPORT

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Abstract
Mobile video broadcasting can be made more beneficial and resource utilizing. This paper makes use of a Knowledge enhanced Mobile Video Broadcasting (KVM-Cast). This KVM-Cloud which is built on a linear transmission channel, extracts the most commonly used correlated information in the cloud which is made up by using the joint source channel coding. This model exploits the hierarchical Bayesian model for bringing up all the necessary correlated information together for reconstructing the video at the receiving end. This model distils the correlated information for attaining high quality video and the Bayesian estimation algorithm is used to maximize the video quality. The KMV-Cast system consists of both likelihood broadcasting and prior knowledge broadcasting. The KMV-Cast system performs better than the already existing systems and achieves more Peak Signal Noise Ratio (PSNR).

Keywords: **Peak Signal Noise Ratio (PSNR), Correlated information, Cloud Computing, Quality of Service (QoS)**

I. INTRODUCTION

On the basis of research done by the CISCO VNI mobile forecast [1]. The result says the video services will increase abruptly between 2014 and 2019. On the other hand, it is expected that the 4G/5G communication will increase to linear network capacity. [2] If we closely watch the traffic in network it often show the correlation between the similarities in the images. Cloud computing also holds many advantages like offering the services, network. There is a high chance of finding the similar images and vide videos due to duplicate content. They came up with a system with two functions which recovers the video rapidly at the receiver. It contains two functions.

- Correlated information extraction
- Utilization of such information

A mechanism called soft-cast is used which is to avoid quantization, entropy problems, channel encoding and overcome the cliff effects of wireless video broadcasting. But correlated information was not pondered. Another named technology used is DaC-RAN [3] makes ample use of the correlated information thereby improvising the rebuilt picture/video quality. But mutual intrusion happened in the rebuilt pictures which increased the channel signal noise ratio (SNR), holds back the linear improvement of the Peak Signal Noise Ratio (PSNR) of the rebuilt picture.

A Qos enhanced KMV-cast framework is introduced which provides high quality rebuilt picture/video using the correlated information in the cloud. The following are the three significant aspects that this paper contributes towards.

The correlated information that is present in the cloud is represented as the prior knowledge in the Bayesian learning which improves the picture/video rebuilt. The relationship between the transmitted video and the correlated information is illustrated by the hierarchical Bayesian model.

II.

For improvising the quality of the rebuilt picture/video in terms of PSNR, prior knowledge distilling scheme and the Bayesian reconstruction algorithm is being designed. The

most correlated information is preserved for the purpose of recovering the video.

2. In this knowledge enhanced mobile video broadcasting (KMV-cast), the likelihood and prior knowledge are broadcasted separately.

II. LITERATURE SURVEY

According the report of the research [4] done, there is inflation of about 60% in the total number of cloud services users in the period of 2011-2012. Also the number of owners of the private cloud will also reach heights with growing competition between top operators like, Google, Apple, Microsoft and Drop box who provide services to 85% of the cloud resources in the world. The total number of personal cloud users is anticipated to condense more than 3 billion contributing to about 25 % growth rate which is calculated in a certain period of time. Therefore the total number of data stored in the cloud will also reach zenith.

Mobile Cloud computing [5] is providing data storage and processing of data in the cloud. This makes the MCC users make good usage of the cloud and reduces the overhead of utilizing battery life and storage acquisition which is a constraint in mobile, for storing data. This also enables security and reliability of data providing more privacy to the MCC users. This technique impresses it's users with its ability to be available all time, providing scalability to storage and processing of data. This creates a huge increase in the number of mobile cloud users and enormous data will be stored in the cloud.

[6] Cloud computing is erupting as a paradigm for video distribution in cloud because traditional video distribution network fails to cope with the emerging network utilizers because of distributed data centres. But the Video Service Providers (VSP) because of the rentals of cloud resources has to increase the operational cost. This can be solves by the cloud based video distribution system that takes up operational cost and providing best experience to user into account by min-flow algorithm and Nash bargaining solution for deriving an optimal bandwidth. This method will provide VSP to increase their number of people who broadcast video via a cloud assisted channel.

The emergence of cloud platforms allows the Video Service Providers to make use of the Cloud Service Provider [7]. But some CSP like the Amazon EC2 provides various service corresponding pricing options for variance in the instances used. Some instances include the on-demand, reserved and spot instances. This is a major hurdle for the VSP to choose and optimal distribution network, given a budget. To overcome this, certain algorithms were proposed that guarantees optimal usage of the VM under any instance and lowers the rental costs for the VSP without degrading the Quality of Experience to the customers. But the quality can be even more increased by providing options like the video can change it's playback rate according to the bandwidth availability.

Since 2009, the growth of usage of mobile cloud has increased substantially [8]. Despite this, the demand to improvise the quality of service provided is most wanted. There are many shortcomings that are yet to be addressed in cloud assisted video transmitting.

The factors for providing cloud based multimedia services are Quality of services and multicast services. Although it lack from the most important element called user perception. This model constitute of three parts,

- QoE function
- Practical measurement
- Statistical analysis

We first consult how to design the QoE[9], next the practical measurement and last the statistical analysis. To colloid the network QoS parameter into the QoE, a stimulated streaming is used to denote the cloud based multimedia. If the value of QoE is lower than derived bound value, then one of the multicast member has low QoE. It shows that users QoE and network Qos are consistent with each other.

The evolution of visual big data is like a double-edged sword for mobile communication. The large scale of visual data transmission creates a major challenge to RAN. The new architecture called DaC-RAN [3] is proposed which

integrates the ideas of SDN and C-RAN. This is used to separate the control and the data planes in the olden architecture. And it also integrate a new data plan with is specially designed for virtual communication into the virtual base communication. The DaC-RAN is explained through a practical communication system with is based on pseudo-analog, data sampling and reconstruction. The correlated information is gathered from the visual big data with is used as a prior knowledge. The main advantage of this system is that it reduces the traffic and increases the spectrum efficiency.

Since the video traffic over the mobile networks is increasing, the wire link capacity cannot cope-up with the traffic demand. The gap between the traffic and link capacity leads to the poor service quality like large buffering time and intermittent disruption. This holds a new model with has a base for the AMES cloud. This cloud has two main parts

- Adaptive mobile video streaming (AMoV)
- Efficient social video sharing (ESoV)

These two parts builds a private agent provide video streaming efficiently. AMoV allows their agent to adaptively adjust their streaming flow with the scalable video technique based on the feedback of the quality of the link. AMES-cloud framework is used to demonstrate its performance.

For a 2-d [10] discrete cosine transform image coding system there is a different assumption considering the distribution of the transform coefficient. This shows the result of the distribution test which indicates the statistics of the coefficient is correctly approximated by Gaussian law. From the stimulation of the DCT coding system it shows the assumption are Laplacian coefficient .That yields a high signal-to- noise power ratio. And also provides a good agreement between the theory and simulations than Guassian assumptions

The two important topics of signal processing and cognitive radio network are compressive sensing (CS) [11] and spectrum sensing. Because of the limitations in the sampling rate in the analog- to-digital converter which is used in spectrum sensing, a new system is proposed which integrates the above two functions.

Since the interference range of the users is limited, the multiple cluster don't share a common sparse spectrum. This develops a multitasking spectrum sensing method based on the spatiotemporal data mining. We assume that in every cluster the spectrum sensing method is executed in a synchronized way. The operations are managed by the cluster head(CH) and a common sparseness is used to consensus decisions .

To exploit the time domain among the continuous CS, a Markov model is deployed. This is used to describe the relationship between the hidden subcarrier and the continuous CS .The results shows that the algorithm is successfully exploits the spatiotemporal relationship, which is used to achieve higher spectrum performance in terms of mean square error ,probability correct detector and chances of false alarm.

III. EXPERIMENTAL RESULTS

The performance of the come up with KVM-Cast Video transmission architecture in terms of the PSNR is evaluated and it's correctness and efficacy is being illustrated. If the transmitted signal is in a slow fading channel, equalizer can be used to normalize the channel distortion. The rebuilt video quality using the come up with KVM-Cast has been derived in a closed form.
Similar to softcast video transmission framework, the transmitted video is segmented into frames and we implement the come up with scheme for video transmission with similar images stored in transmitter and receiver.

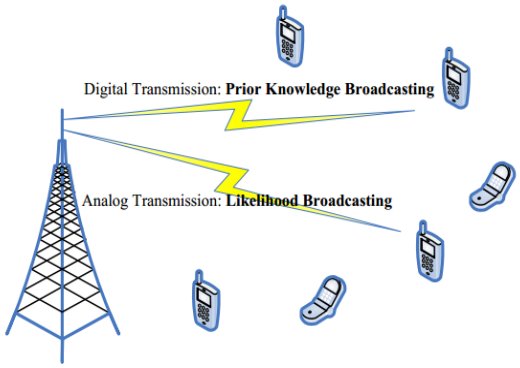

Fig: KVM-Cast Transmission Scenario

Comparison is made between the come up with KVM-Cast model and the existing four models, they are uncoded video transmission. DaC-RAN,SoftCast and JPEG2000+802.11a. Pixel values or DCT-Coefficients are transmitted directly in the uncoded video transmission. Dac-RAN Scheme assumes that the same video frame exists at the receiver end and uses a Bayesian model but a KVM-Cast does not assume that the same video frame is available at the receiver end. Softcast, reallocates the total transmission power to each of the DCT coefficient for maximizing the PSNR of the rebuilt video frame, power scaling. Based on JPEG2000 standard, the transmitted image is compressed and the convoluting code at rates of ½, 2/3 and ¾ is being used in the JPEG2000+802.11a. An appropriate modulation scheme and channel coding rate defined in IEEE 802.11a standard is used and transmits the compressed image.

They came up with KVM-Cast, that extracts correlated information is distilled into prior knowledge, for helping with the video reconstruction.

IV. CONSOLIDATION TABLE

S.NO	TITLE	DESCRIPTION	DRAWBACK
1	Cisco visual networking index: Global mobile data traffic forecast	Network Traffic Analysis	NA
2	Effective load balancing for cloud based multimedia system	Increase in 4G/5G communication	NA
3	DaC-RAN: Data-assisted Cloud Radio Access Network for Visual Communications,	a new data plan with is specially designed for virtual communication into the virtual base communication	Signal ratio is high
4	www.pweb.com/release/2014/04/prweb11776359.htm.	Inflation in private cloud users	Need for mobile cloud
5	A survey of mobile cloud computing: Architecture, Application and Approach	Use of mobile cloud computing	Increase in operational cost
6	Toward Optimal Deployment of Cloud-Assisted Video Distribution Services	Reducing cost	Optimal usage requirement
7	On the CostCQoE Trade off for Cloud-Based Video Streaming Under Amazon EC2's Pricing Models	Optimized usage at any instance	Needs adaptable playback
8	Context aware mobile cloud computing :Review	Using cloud for video distribution	Increasing QoE of users
9	QoS/QoE Mapping and Adjustment Model in the Cloud-based Multimedia Infrastructure	Created a wide user satisfaction	More distortion in signal
10	Distributions of the Two-Dimensional DCT Coefficients for Images	High signal to noise power ratio	No spatiotemporal relationship
11	Multitask Spectrum Sensing in Cognitive Radio Networks via Spatiotemporal Data Mining	Increases spatiotemporal relationship	Less use of knowledge enhanced system

V. CONCLUSION

The KVM Cast is being proposed to improve the quality of the mobile video broadcasting. In this method, the correlated information has been represented as prior knowledge and exploited in the video reconstruction at the receiver which makes KVM Cast to outstand from other ideas. This KVM Cast makes use of the hierarchical Bayesian model which bridges the transmitted video and prior knowledge. In the prior knowledge distilling method, the most correlated information is taken into account for peaking the PSNR of the reconstructed video. The results have being proving that the proposed KVM-Cast outperforms than the existing ones, thereby providing a good quality of reconstructed video.

VI. REFERENCES

[1] Cisco, "Cisco Visual Networking Index: Global Mobile Data Traffic Forecast Update 2014-2019," Cisco White Paper, Feb. 2015.

[2] Wen Hui, Hai-ying Zhao, Chuang Lin, Yang Yang, "Effective Load Balancing for Cloud-based Multimedia System," in *Proc. of EMEIT*, Harbin, China, Aug. 12-14, 2011, pp. 165-168.

[3] Jun Wu, Dian Liu, Xin-Lin Huang, Chong Luo, Hao Cui, Feng Wu, "DaC- AN: Data-assisted Cloud Radio Access Network for Visual Communications," IEEE Wireless Communications, vol. 22, no. 3, pp. 130-136, Jun. 2015.

[4]www.prweb.com/releases/2014/04/prweb11776359.htm

[5] Hoang T. Dinh, Chonho Lee, Dusit Niyato, Ping Wang, "A Survey of Mobile Cloud Computing: Architecture, Applications, and Approaches," Wireless Communications and Mobile Computing, vol. 13, no. 18, pp. 1587-1611, Dec. 2013.

[6] Jian He, Di Wu, Yupeng Zeng, Xiaojun Hei, Yonggang Wen, "Toward Optimal Deployment of Cloud-Assisted Video Distribution Services," IEEE Transactions on Circuits and Systems for Video Technology, vol. 23, no. 10, pp. 1717-1728, Oct. 2013.

[7] Jian He, Yonggang Wen, Jianwei Huang, Di Wu, "On the CostCQoE Tradeoff for Cloud-Based Video Streaming Under Amazon EC2's Pricing Models," IEEE Transactions on Circuits and Systems for Video Technology, vol. 24, no. 4, pp. 669-680, Apr. 2014.

[8] Xiaofei Wang, Ted "Taekyoung" Kwon, Yanghee Choi, Haiyang Wang, Jiangchuan Liu, "Cloud-Assisted Adaptive Video Streaming and Social- ware Video Prefetching for Mobile Users," IEEE Wireless Communications, vol. 20, no. 3, pp. 72- 9, Jun. 2013.

[9] Dipayan Dev, Krishna Lal Baishnab, "A Review and Research Towards Mobile Cloud Computing," in *Proc. of IEEE MobilCloud*, Oxford, United Kingdom, Apr. 8- 11, 2014, pp.252- 56.

[10] Min Chen, "AMVSC: A Framework of Adaptive Mobile Video Streaming in the Cloud," in *Proc. Of IEEE Globecom*, Anaheim, USA, Dec. 3-7, 2012, pp. 2042-2047.

[11] Xin-Lin Huang, Gang Wang, Fei Hu, "Multitask Spectrum Sensing in Cognitive Radio Networks via Spatiotemporal Data Mining," IEEE Transactions on Vehicular Technology, vol. 62, no. 2, pp. 809-823, Feb. 2013.