A Routing policy for Minimizing Distortion for Video Traffic in Wireless Multihop Networks

K.SUSMITHA
PG Scholar, Dept of CSE
Intell Engineering College
Anantapur, AP, India

T.V. NAGA JAYUDU
Associate Professor, Dept of CSE
Intell Engineering College
Anantapur, AP, India

*Abstract:-***Ordinary routing algorithms intended for wireless network are application rationalist, so to conquer this we consider a wireless network where the application streams consists of video traffic. Lessening this distortion is basic for the client. Utilizing join quality based routing measurements can't minimize video distortion. Along these lines, we construct an investigative structure to see first and afterward to survey the effect of wireless network on video distortion. Utilizing this we can define a routing arrangement for minimizing distortion. We find by means of analyses that our convention is effective in diminishing video distortion. Routing conventions intended for wireless networks subsequent to a long time are application particular. Here, we are attempting to lessen distortion in video traffic streaming over a wireless network. Today's clients request excellent videos to be conveyed flawlessly on their gadgets. In this paper, we talk about routing arrangements to decrease video distortion on a conclusion to end premise. Conventional and well known connection based routing measurements, for example, ETX cause high video distortion as they don't represent reliance over the connections of a way. Subsequently, video traffic proceeds onto couple of ways creating distortion. To decrease the distortion in videos and report outline misfortune in videos, we construct a logical structure. A routing convention for lessening distortion in videos is composed in light of the structure's routing approach. Simulations are done to demonstrate the convention outlined is productive in minimizing video distortion.**

*Keywords-***Wireless Network, Protocol, Distortion, Routing, Analytical Framework.**

I. INTRODUCTION

Video traffic has turned into an issue these days because of the expansion in the utilization of wireless networks. Keeping up a decent nature of video is essential. The video quality is influenced by: 1) the distortion because of compression at the source and 2) distortion because of both wireless channel impelled blunders and impedance.

Bunches like I, P and Btype outlines give diverse levels of encoding. In I outline information is encoded freely, in P and B outlines information is encoded in respect to information encoded inside other casing.

Video quality can be enhanced by representing application necessities. The plans used to encode a video clasp can oblige a specific number of bundle misfortunes per outline. In the event that the quantity of lost parcels surpasses limit esteem then the casing can't be decoded accurately. In this manner, coming about a distortion. The estimation of distortion relies on upon position of unrecoverable video outlines in the GOP (Group of Pictures). In this way, we construct an explanatory model to see the conduct of the procedure that depicts the evolution of edge misfortunes in the GOP. Utilizing this we catch how the decision of way for a conclusion to-end stream influence the execution of a stream as far as video distortion.

Our model is manufactured taking into account a multilayer on methodology as appeared in fig1.The parcel misfortune likelihood on a connection is mapped to the likelihood of a casing misfortune in the GOP and the edge misfortune likelihood is then specifically connected with the video distortion

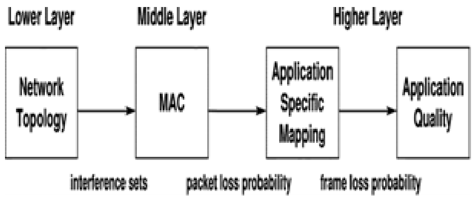

Fig. 1. Multilayer approach

Broadband and wireless communication frameworks in this day and age are more hearty and omnipresent than they used to be before [2]. In everyday life we watch wireless communications happening in cell and wireless neighborhood. This communication is watched only in the last two gadgets i.e. a base station and a wireless end framework. Multihop wireless networks have one or numerous middle of the road hubs which freely impart among themselves along the course and send or get parcels utilizing wireless connections. Multihop networks can perform routing in an independent way, since they don't depend on any past system base [1]. Web applications, for example, IPTV (Internet Protocol Television) and

VOIP (Voice over Internet Protocol) which have high piece – rate mixed media content and high QOS (Quality of Service) are being conveyed to clients because of expansion in data transmissions of broadband a seemingly endless amount of time. Giving broadband access is still a test in provincial and rocky regions as a result of specialized and/or economic reasons because of which individuals living in such regions can't profit by the focal points offered by broadband access . 802.11 WLANs have restricted scope and one-jump wireless networks, for example, 3G and authorized WiMAX are excessive and as a rule require licenses for channel. Multihop broadband wireless networks is a solution which gives broadband access along abundantly required QoS .Multihop wireless networks have one or numerous middle of the road hubs which autonomously convey among themselves along the course and send or get bundles utilizing wireless connections. Multihop networks can perform routing in an independent way, since they don't depend on any past system base. Research interest has been expanding in wireless networks to convey sight and sound ser frosts as media is required to be a noteworthy traffic source over next – generation wireless networks [3]. Sight and sound traffic is turning out to be exceptionally well known in wireless networks with the happening to smartphones. Exchange of video clasps, pictures and voice information in regions of regular catastrophes, fiasco recuperation, dry season hit regions, and so forth to encourage mission administration by government offices and NGO's has come as a would like to individuals in trouble. Under such compelling situations keeping up a decent nature of the video which is exchanged is requesting from the client's prospect. The nature of video sent over wireless network is impacted by: 1) the utilization of compression methods amid which commotion or distortion is included at the source and 2) both, blunders entering in wireless channel and altering likewise causes distortion in video [4]. Transmission misfortunes can avoided by utilizing diverse levels of encoding portrayed in video encoding guidelines like MPEG-4 [7] or H.264/AVC [8]. I-write, P-sort and Btype edges are gatherings of edge sorts which are characterized in these encoding benchmarks. If there should be an occurrence of I-write outlines information is encoded autonomously. If there should be an occurrence of P-sort and B-sort outlines encoding is performed taking into account the information encoded inside different edges. Application-level execution of video transmissions can be inferred utilizing Group of Pictures (GoP) which takes into account the coordinating of edge misfortunes into a distortion metric

II. RELATED WORK

Encoding and transmission of a video is taken care of from numerous points of view and there are a lot of recommendations from various standardization bodies which administer the encoding and transmission of video. Unique video clasp can be divided into various substreams and transmitted over disjoint ways on a network. This method to section a unique video clasp and after that transmit is called Multiple Description Coding (MDC). Deciphering procedure of the first video clasp can be fruitful utilizing the descriptions sent on the network and the nature of the video is enhanced with the quantity of decoded substreams. Layered Coding is another method to send and enhance the video quality. Different upgrade layers along with a base layer are utilized as a part of this method. Base layer is the mosthuge layer as improvement layers are there only to refine the base layer quality and not helpful independent from anyone else.

In this manner, in an encoded signal the base layer is the most basic layer. Layered Coding is embraced in this paper because of its prevalence in applications and guidelines received

Earlier work on routing for video communications concentrates on Multiple Description Coding (MDC). In multipath routing plans are considered to enhance the nature of video exchange. In [an extension to the Dynamic Source Routing is proposed to bolster multipath video communications. The essential thought is to utilize the information gathered at the destination hub to register almost disjoint ways. In contrast with our methodology, no examination is given in [17], and the evaluation of the plan is construct exclusively in light of simulations. In [18], the computation of disjoint ways is accomplished by legitimate booking given an arrangement of way lengths. Just like the case in [17], the work in does not consider any execution metric straightforwardly connected with video quality; in contrast, the optimization depends on postponement constraints. In [19] and [20], MDC is considered for video multicast in wireless specially appointed networks. A rate-distortion model is characterized and utilized as a part of an optimization issue where the goal is to minimize the general video distortion by legitimately selecting routing ways. Because of the intricacy of the optimization issue, a hereditary calculation based heuristic methodology is utilized to register the courses. Despite the fact that the methodology considers the distortion of the video, it does as such utilizing MDC. Our methodology contrasts on the way wemodel video distortion, as well as on the way that we concentrate on LC, which is more famous in applications today. In [21], a multipath routing plan for video conveyance over IEEE 802.11-based wireless lattice networks is proposed. To accomplish great traffic building, the plan depends on maximally disjoint ways. Nonetheless, this work does not consider distortion as a client saw metric. It just intends to lessen the inertness of video transmissions, and subsequently, its goal is unique in relation to what we consider here. The work in [22] proposes a plan for vitality effective video communications with least QoS degradation for LC. Be that as it may, the routing plan depends on a various leveled model. To backing such a chain of importance, the hubs should be assembled in groups, and a procedure of choosing a bunch head must be executed intermittently, expanding the preparing and information communication heap of the network. In contrast, our proposed plan expect a level model where all hubs in the network are identical and play out the same arrangement of assignments.

A various leveled model is utilized to outline a routing plan for vitality effective video transmission with least QoS degradation for LC. Such progressive models rely on upon hubs which are consolidated in groups and an occasional procedure of choosing a bunch head happens. This increments regulatory casings on the network along these lines expanding the handling and information communication. A model where all hubs of a network play out the same arrangement of undertakings and are equivalent with no progressive system is proposed in our plan.

III. EXISTING SYSTEM

The encoding and transmission of video shows the noteworthiness of video communication. Distinctive methodologies exist in taking care of such an encoding and transmission. Numerous description coding is a coding system that sections a solitary media stream into n sub streams referred to a description. The bundles of every description are directed over numerous (halfway), disjoint ways. Keeping in mind the end goal to disentangle the media stream any description can be utilized. The possibility of MDC is to give mistake strength to media stream.

Layered coding (LC) instrument creates a base layer and n improvement layers. The base layer is vital for the media stream to be decoded, upgrade layers are connected to enhance stream quality. The first improvement layer relies on upon the base layer and every upgrade layer n+1 relies on upon its sub-ordinates layer n.

We utilize principles like the MPEG-4 and the H.264/AVC which give rules to a transmission over a communication framework in view of layer coding. The introductory video clasp is isolated into an arrangement of casings of various significance regarding quality and henceforth diverse levels of encoding. The casings are called I-,P-,B-outlines constitute a structure named the GOP.

In another current model, a scientific structure is created to display the impacts of wireless channel blurring on video distortion. In other existing model, the creators look at the impact of bundle misfortune designs and particularly the length of mistake blasts on the distortion of compressed video.

IV. PROPOSED SYSTEM

In this anticipate, we examine how video distortion experienced by the end client can be altogether lessened and the nature of video is enhanced by figuring the application necessities. Certain number of parcel misfortunes per casing can be taken care of by various plans used to encode a video cut. Any casing can't be decoded if the lost parcels in a casing surpass a specific edge esteem. Distortion increments in a video stream with each loss of edge. At every jump along the way from source to destination the estimation of distortion relies on upon the positions of the unrecoverable video outlines in the GOP. Multilayer outline methodology is utilized as a part of our model as appeared in Fig1. Evolution of casing misfortunes in GOP are composed in a diagnostic model which used to layout the dynamic conduct of the procedure rather than only focussing on a solitary network quality metric, for example, parcel misfortune likelihood. The likelihood of edge misfortune in GOP is coordinated with likelihood of bundle misfortune on a connection. Video distortion metric is then straightforwardly identified with likelihood of edge misfortune. Routing can be acted like an optimization issue by utilizing the above mapping from parcel misfortune likelihood to video distortion where the goal is to minimize the end to end distortion by finding the way from source to destination [4]. In our conception, along the complete way add up to history of misfortunes in GoP is taken into report particularly contrasted with traditional routing, for example, all out expected transmission count (ETX) [26] which is in contrast to our routing convention where the connections are autonomously treated. Outline misfortune procedure is caught utilizing dynamic programming approach. To minimize distortion, we have composed a routing convention situated in the above solution. I-write outlines which are longer edges among the three casings are carried on the ways that have slightest congestion since the loss of these edges that convey fine grained information influences the distortion metric more. With least distortion our routing plan is improved for transmission of video clasps on wireless networks and constraints identifying with time like jitter are not considered specifically in the outline

1) Impact of routing on video distortion is developed using a systematic approach: An efficient methodology that catches the effect of routing on the end to end nature of video regarding distortion is the essential contribution. Least distortion is achieved by computation of ideal courses in the structure. Effect of Physical layer and MAC layer is mutually considered in the model and the application semantics on the video quality.

2) Distortion resistant video delivery system is designed using a practical routing protocol: In understanding to the distortion and the position of an edge in the GoP, the source is utilized to gather distortion information on the connections in the network composed in the convention. Basically wireless video is carried on the network utilizing this routing convention

3) Extensive experimentation done for evaluations: End to end video distortion is kept to a base and demonstrated by utilizing the convention which is tried by simulations and continuous experimentation utilizing a 802.11a mulihop network. Top Signal to Noise Ratio of video traffic is expanded by 20% while utilizing this convention. This produces traffic with a MOS (Mean Opinion Score) that is 3 times higher when contrasted with traditional routing plans. Nature of video got at the destination is enhanced altogether with additions in PSNR and MOS .Different framework parameters are likewise used to assess our convention

V. MODEL FORMULATION

The proposed approach comprises the accompanying steps: Multihop routing networks, Video distortion model,

Video distortion minimization and Video distortion dynamics.

A. Physical and MAC layer Modeling

Multi-jump cell system (MCN) is a configuration proposed for remote correspondence and MCNs join the upsides of having a settled base of base stations and the flexibility of exceptionally named systems. They are prepared for achieving much higher throughput than current cell structures, which can be named single-jump cell systems (SCNs). This work concentrates on MCNs and SCNs using the IEEE 802.11 standard for remote LANs. We give a general framework of the building and the issues required in the configuration of MCNs, particularly the troubles to be met in the configuration of a coordinating convention. We propose a guiding convention for use in such systems. We lead expansive test contemplates on the execution of MCNs and SCNs under various weight conditions (both TCP and UDP). By then concentrates doubtlessly demonstrate that MCNs with the proposed guiding convention are a reasonable option for SCNs, honestly they give much higher throughput.

Considering an IEEE 802.11 network where the arrangement of hubs is signified by N .Since this model is application rationalist this gives the parcel misfortune likelihood because of traffic and impedance in the network. Using the Network loss model we derive the 3 equations. the first is to scheduling model, that computes the serving rate Pi, p of a path at each node, as a function of the scheduler coefficient Ki, p and the service time.

Pi,p=Ki,pE[Ti,p] (1)

The second captures the MAC and PHY and associates the probability βi,p of a failure with access probability ói,p

ói,p= 2(1-2βi,p)

W(1-2Bi,p)+βi,p(w+1)(1-(2βi,p)B) (2)

Where B is the number of back off stages and W is the minimum window size. The third describes the routing model and computes the incoming traffic rate λj,p

λj,p=KI,P(1-Bi,p) (3)

Using the iteration we join the equations until the result is achieved. Which gives the approximate packet loss probability.

B. Video distortion model

Analytical model couples the functionality of the physical and MAC layers of the network. The application layer for a video clip is sent from a source to a destination node. The model for the lower layers computes the packetloss probability by a set of equations. Packet-loss probability is then input to a second model to compute the frame-loss probability then corresponding distortion.

Since we are using the multi-hop we, develop a analysis model where it captures the evaluation of the distortion at different links from source to destination by considering a GOP structure which consists of an I-frame followed by P-frames. So the index each frame in the GOP starting from 0, i.e., the I-frame corresponds to index 0, and the P-frames correspond to indices from 1 up to. We focus on predictive source coding where, if the ith frame is the first lost frame in a GOP, then the ith frame and all its successors in the GOP are replaced by the (i-1) st frame at the destination node.

The average distortion D(i) is computed using linear model which gives the average mean square error is:

D(i)=(F-i)* i*F*Dmin+(F-i-1)*Dmax

(F-1)*F (4)

For i=0,1,2,3---------(F-1)

Dmin=D(F-1) is achieved when the last frame of GOP is lost. Dmax=D(0) is achieved when the first frame is lost. We can define the sequence D={Dt,t=0,1,2} to represent the wireless transmission distortion along the path from the source to the destination, where Dt is the wireless transmission video distortion at the t th hop. So, the distortion can be one of the following:

{D(0), D(1),---------D(F-1)}U{0} (5)

The number of packet losses per frame can be computed by defining the multi- dimensional process M={Mt,t=0,1,2,---}

Mt=(Mt(0),Mt(1),Mt(F-1)) (6)

If the β is the packet loss probability then the transmission probability of process M at hop t is: Mt= (i0,i1,i2,-----i(F-1))

At hop t+1 is:Mt+1= (j0, j1, ----j (F-1)) (7)

The transition probability of first component M(0) is

Φ(0)i0j0 =P{Mt+1(0)=j0|Mt(0)=io} (8)

C. Video Distortion Dynamics

An analytical model is structured to characterize the dynamic behavior of the process that describes the evolution of frame losses in the GOP as video is delivered on an end-to-end path. The model captures how the choice of path for an end-to-end flow affects the performance of a flow in terms of video distortion.

The position of the first unrecoverable frame in the GOP gives the value of the distortion D at hop t from source to the destination. The process C can be defined as:

C= {Ct, t=0,1, 2,----------} (9)

The value of the process at set is:

C= {0, 1, 2, -----F-1, F} (10)

The value 0 indicates that the I frame is lost, the value between the 1 and F-1 indicatesthat the P frame is lost. And the value F indicates that no frame is lost that is the value of distortion is 0.The transition probabilities at hop t=0, 1, 2. --- Of the process C

Pt(I,j)=P{Ct+1=j|Ct=i} (11)

The value of the video transmission distortion depends on the value of the process at hop t is:

Dt= {0, if Ct=F }

D(c), if Ct=c and 0<=c<= (F-1) (12)

D.Video Distortion Minimization

Solution to the problem is based on a dynamic programming approach that effectively captures frame-loss process. A practical routing protocol is designed to minimize the distortion. The loss of the longer I-frames carry information affects the distortion metric more. The approach ensures that these frames are carried on the paths that experience the least congestion.

VI. PROTOCOL DESIGN

To process the solution to the MDR issue depicted, information of the complete network the hubs that are available in the network and the nature of the connections between these hubs) is essential. Be that as it may, in view of the dynamic nature and dispersed operations of a network, such finish information of the worldwide state is not generally accessible to the hubs. Practically speaking, the solution to the MDR issue can be registered by the source hub in light of fractional information in regards to the worldwide state that it accumulates. The source hub needs to test the network amid a way disclosure process with a specific end goal to gather information in regards to the condition of the network. The inspecting procedure incorporates the estimation of the ETX metric [3] for every wireless connection in the network. These appraisals give a measure of the nature of the connections. The estimation procedure can be executed by following the effective television of test messages in intermittent time interims. The ETX gauges registered locally in the area of a hub are then annexed in the Route Request messages amid the Route Discovery stage. Upon reception of this message by the destination, a Route Reply message is sent back to the source that contains the processed ETX gauges, which are usable to register .

In the source routing plan, the routing decisions are made at the source hub early and before the bundle enters the network. Along these lines, source routing is an open-circle control issue where all decisions must be made in the first place. The decisions are taken consecutively; a decision at a phase corresponds to the decision of the following jump hub at the hub corresponding to the stage. The source hub can't know precisely the state at the th phase of the selection procedure in light of the arbitrariness of the second component of the state. It needs to gauge at every stage the estimation of and utilize this evaluation to settle on a decision for that stage.

Algorithm 1: Path discovery (Uses Algorithm 2)

Input: source node s, destination node d.

Input: Frame size F.

Output: route R from s to d.

1: /* Route discovery */

2: send Route Request

3: receive Route Replay (ni,ETXi) message

(IJITR) INTERNATIONAL JOURNAL OF INNOVATIVE TECHNOLOGY AND RESEARCH
Volume No.4, Issue No.4, June – July 2016, 3257 – 3263.

4: N= {node-ids ni from Route Reply messages}

5:

6: /* path discovery */

7: n<- S

8: c<- F

9: B= {(d, c) | 0<=C<=F}

10: R<- [ ]

11: x<- (n, c)

12: append x to R

13:/* Path computation /*

14: repeat

15: u* <- next_node_in_optimal path(x,B,N)

16: c^ <- E[Cnew | Ccur=c]

17: n<- u*

18: c <-c^

19: x <- (n, c)

20: append x to R

21: N<- N-{u*}

22: until x϶ B

Algorithm 2: Next Node in optimal path

Input: Initial state xs, boundary set B

Input: set of available nodes N

Output: net node n* in the optimal path

1: /* Initialization */

2: C= {0, 1,----F}

3: L=N*C

4: T <- ||L||

5: /* optimal control computation */

6: for i=T to 1 do

7: if i=T then

8: for all xϵH do

9: Ji(x) <- K(x)

10: end for

11: else

12: for all x= (n, c) ϵ H do

13: U (n) <- {n` | n, n`1-hop neighbors}

14: ji(x, u) <- {g(x, u) + sum of x` Pi (c, c` | 0) Ji+1 (x`)}

15: Ji(x) <- minuϵU(n) ji(x, u)

16: Pi(x) <- arg min uϵU (n) ji(x, u)

17: end for

18: end if

19: end for

20: n* <- p, (xs)

21: return n*

VII. RESULTS

We demonstrate the execution increases of the proposed routing plan by means of broad simulations and testbed tests. For the simulation tests, we utilize the network test system ns-2. The test system gives a full convention stack to a wireless multihop network in light of IEEE 802.11. We develop the functionality of ns-2 by actualizing our proposed routing plan on top of the present convention stack. For the testbedtests, we execute our plan utilizing the Click secluded switch. We actualize two unique instruments and explore different avenues regarding every, one after another. The primary instrument assesses the ETX esteem for every connection between a hub and its neighbors for every one of the hubs in the network. The instrument telecasts occasionally (every 1 s) little test messages of size 32 B and checks for affirmations from the neighbors of the hub. The routing strategy registers the base ETX way from the source to an estination and utilizations that way to exchange the video parcels. The second instrument executes the convention characterized in Section V to process the courses on the wireless network that accomplish least video distortion

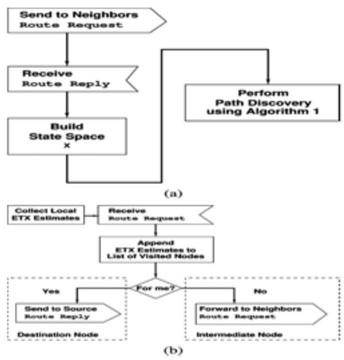

Fig. 2. Flowchart for application-aware routing. (a) Source node. (b) Intermediate and destination node

To assess the execution of the MDR convention, we look at it against the base ETX routing plan. We consider a wireless multihop network that covers a range of 1000 m . The hubs are dispersed over this range as per a Poisson arbitrary field. The pair of hubs that constitute the Fig. 3. Normal PSNR for 5 and 10 video connections (Set-I).source and destination for every situation are chosen aimlessly. On the off chance that they happen to be neighbors, we dispose of that pair and rehash the procedure until we select a source and destination that are more than one bounce separated. Every hub utilizes the IEEE 802.11b convention where the propagation model is the Two Ray Ground, yielding a communication scope of around 250 m. Every arrangement of examinations is rehashed 10 times, and the normal quality is accounted for every situation. We shift the GOP size and the casing rate and accordingly, adequately, the video encoding rate. We keep the edge size constant according to the QCIF standard (176 144 pixels) and set the most extreme parcel size to 1024 B. Our simulation tests concentrate on three measurements: 1) the PSNR, which is a target quality measure; 2) the MOS, which is a subjective quality metric; and 3) the postponement experienced by every video connection. The impact of the hub thickness on the PSNR is appeared in Fig. 3. We plot the normal PSNR for 5 and 10 concurrent video connections for various hub densities and for Set-I of the video encoding parameters of Table I. We additionally plot the execution of our proposed plan (MDR) when as opposed to assessing the per-join parcel misfortune probabilities through the ETX metric, we utilize the model to do as such. For this situation, we expect full learning of the network topology, thus the state space where we take care of the ideal control issue is a superset of the state space when we gather the nearby gauges of ETX through the network.

VIII. CONCLUSION

The routing approach is application-mindful that gives advantages regarding client saw execution. In particular, we consider a network that fundamentally conveys video streams. The effect of routing will be on end-to-end distortion of video streams. For this, we construct an investigative model that binds video distortion to the basic parcel misfortune probabilities. Utilizing this model, we locate the ideal course (as far as distortion) between a source and a destination hub utilizing a dynamic programming approach. In view of our methodology, we outline a down to earth routing plan that we then assess by means of broad simulations and proving ground tests. Traditional measurements, for example, ETX, our methodology considers correlation crosswise over bundle misfortunes that impact video distortion. Our simulation study demonstrates that the distortion is diminished by 20% contrasted with ETX-based routing. The client experience degradation because of expanded traffic load in the network is kept to a base.

IX. REFERENCES

[1] ISO/IEC JTC1/SC29/WG11, "ISO/IEC 14496—Coding of audio-visual objects," [Online]. Available: http://mpeg.chiariglione.org/ standards/mpeg-4/mpeg-4.htm

[2] T. Wiegand, G. J. Sullivan, G. Bjontegaard, and A. Luthra, "Overview of the H.264/AVC video coding standard," IEEE Trans. Circuits Syst. Video Technol., vol. 13, no. 7, pp. 560–576, Jul. 2003.

[3] D. S. J. D. Couto, D. Aguayo, J. Bicket, and R. Morris, "A highthroughput path metric for multi-hop wireless routing," in Proc. 9thMobiCom, San Diego, CA, USA, Sep. 2003, pp. 134–146.

[4] J. M. Boyce, "Packet loss resilient transmission of MPEG video over the internet," Signal Process., Image Commun., vol. 15, no. 1–2, pp. 7–24, Sep. 1999.

[5] Y.-C. Lee, J. Kim, Y. Altunbasak, and R. M. Mersereau, "Layered coded vs. multiple description coded video over error-prone networks," Signal Process., Image Commun., vol. 18, no. 5, pp. 337–356, May 2003.

[6] J. Chakareski, S. Han, and B. Girod, "Layered coding vs. multiple descriptions for video streaming over multiple paths," Multimedia Syst., vol. 10, pp. 275–285, 2005.

[7] Y. Wang, S. Wenger, J. Wen, and A. K. Katsaggelos, "Real-time communications over unreliable networks," IEEE Signal Process. Mag., vol. 17, no. 4, pp. 61–82, Jul. 2000.

[8] R. Zhang, S. L. Regunathan, and K. Rose, "Video coding with optimal inter/intra-mode switching for packet loss resilience," IEEE J. Sel. Areas Commun., vol. 18, no. 6, pp. 966–976, Jun. 2000.

[9] J. Xiao, T. Tillo, and Y. Zhao, "Error-resilient video coding with end-to-end rate-distortion optimized at macroblock level," EURASIP J. Adv. Signal Process., vol. 2011, no. 1, p. 80, 2011.

[10] M. T. Ivrlaˇc, L. U. Choi, E. Steinbach, and J. A. Nossek, "Models and analysis of streaming video transmission over wireless fading channels," Signal Process., Image Commun., vol. 24, no. 8, pp. 651–665,Sep. 2009.

AUTHOR's PROFILE

K.Susmitha is pursuing her M.Tech in Dept of CSE, Intell Engineering College, Affiliated to JNTUA University, Ananthapur.

T.V. Naga Jayudu Working as Associate Professor at Intell Engineering College, Anantapur affiliated by JNTUA University Anantapur.

