Proposal studies on new video metrics

Orange Labs

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HillsBoro Meeting

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Agenda

1 State of Art on limitation of No, Reduced, Full Reference Metrics

2 State of Art Automating Quality Checking

3 Proposal studies

Agenda

1. State of Art on limitation of No, Reduced, Full Reference Metrics
2. State of Art Automating Quality Checking
3. Proposal studies

State of Art on limitation of No, Reduced, Full Reference Metrics for Standardized models

- The most of the models in whole recommendations were validated with some hypothesis working.
  - Frame freezes up to 2 seconds.
  - No default at the beginning or at the end of the video sequence are allowed.
  - Some skip frame is not supported.
  - The video reference should be clean (no spatial or temporal distortions).
  - Minimum delay is supported between video reference and video (sometimes with constant delay) .
  - The up or downscaling operations are not always taken into account.
  - The most model are based on measuring conventional bluriness, blockiness and jerkiness artefacts for producing predictive MOS.

State of Art on No, Reduced, Full Reference Metrics based on video signal only

- Synthesis of MOSp model

Type of Model Resolution	Full reference	Reduced Reference	No Reference
HDTV	ITU-T J.341	Not available	Not available
SDTV	ITU-T J.144	Not available	Not available
QCIF/CIF/ VGA	ITU-T J.247	ITU-T J.246	ITU-T J.247 for QCIF only

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Agenda

1. State of Art on limitation of No, Reduced, Full Reference Metrics
2. State of Art Automating Quality Checking
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State of Art Automating Quality Checking

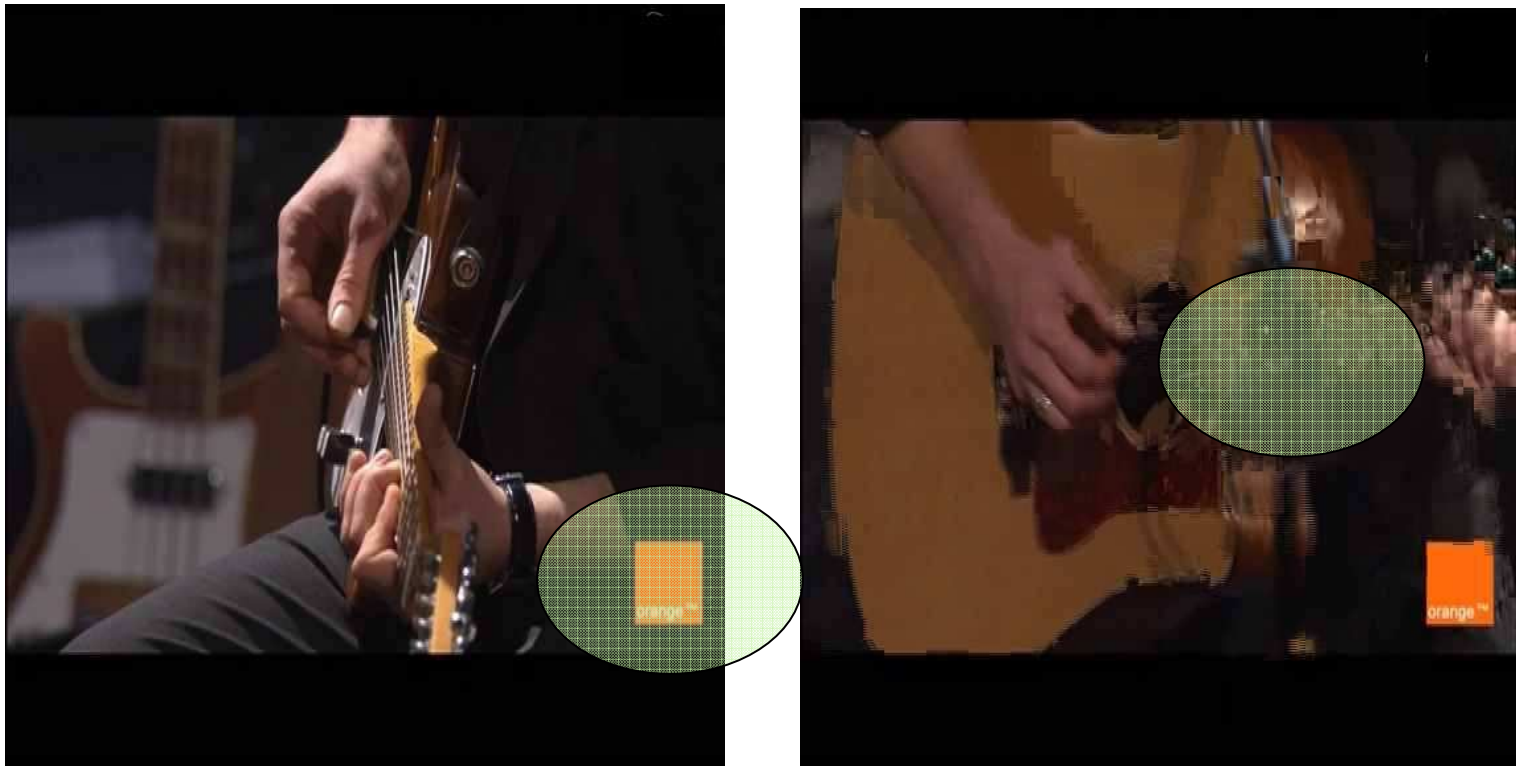
- Automating Quality Checking.
  - Based on finding the major video and audio artifacts.
  - The processing should be done on video signal or on the bit stream.
  - The Quality Checking could be done before, during, or after encoding process.
  - No MOSp is provided
    - Blocking effect.
    - Freeze, jerkiness effect
    - Ghosting effects
    - Slice error or Video Stripes.
    - Aspect ratio conformity
    - Field order conformity.
    - Photosensitive Epilepsy or flashing effect (UIT-R BT.1702).
    - ……

State of Art Automating Quality Checking

- Illustration on Slice error or Video Stripes error.

State of Art Automating Quality Checking

- Aspect ratio error and ghosting error



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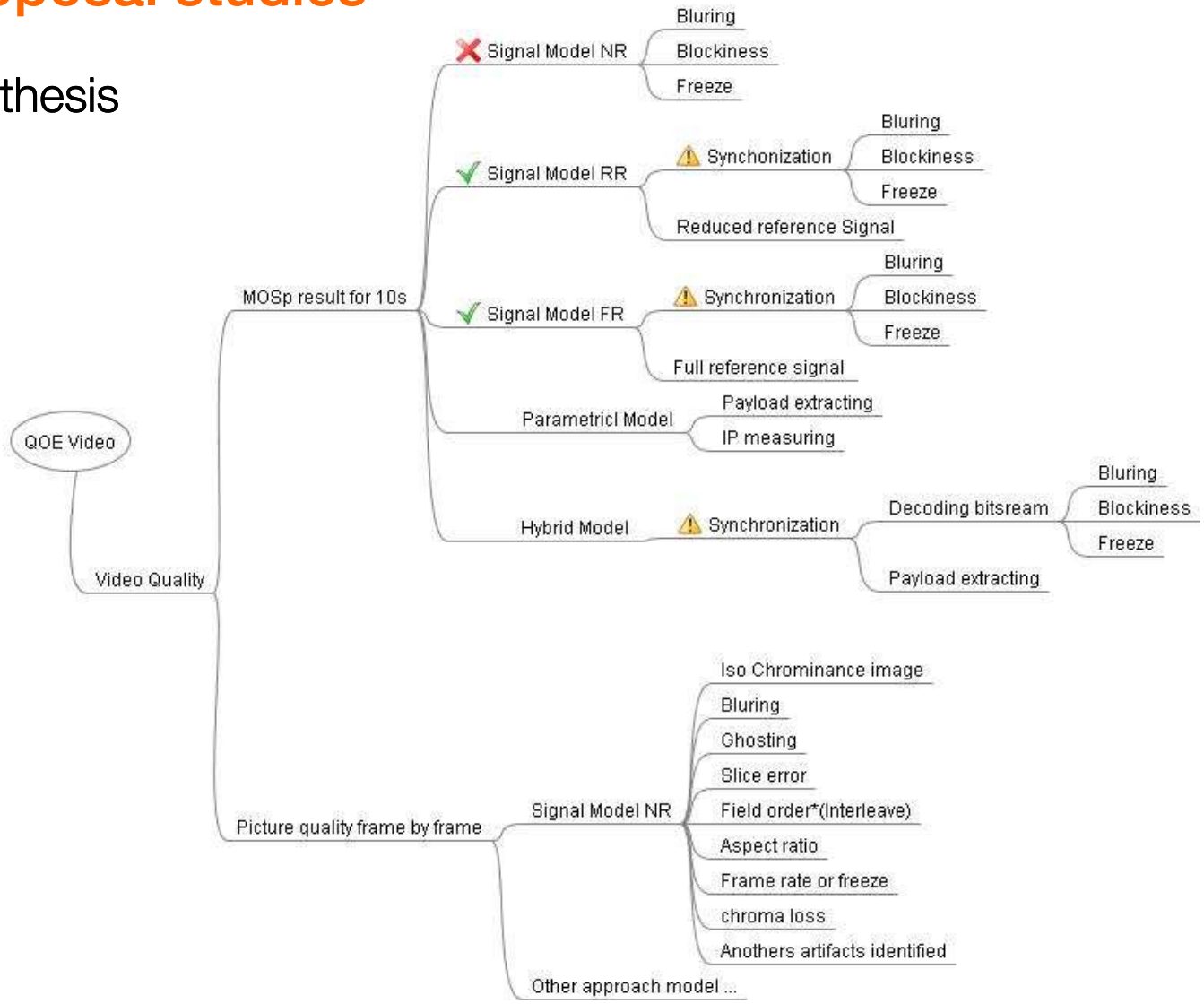
Proposal studies

Synthesis



Proposal studies

1. What kind of methodology should be used ?
   - by choosing acceptability or visibility methodology.
   - by adapting an existing methodology.
   - by creating a new methodology.
   - With expert or non expert viewers ?
   - What is the best time integration (Frame by frame or few seconds) ?

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Proposal studies

2. Additional vocabularies could be proposed on ITU-T Rec. P.10/G.100 (07/2006)
    - Ghosting effects (B-5 blurring)
    - Slice error or Video Stripes.
    - Aspect ratio conformity
    - Field order conformity.
    - Photosensitive Epilepsy or flashing effect (UIT-R BT.1702)
    - ….

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Proposal studies

2. Validation models

- What the artifacts should be studied in priority.
- The labs could submit the best part of the models already developped for each video artifacts.
- The models could be based on NR video signal, parametric or hybrid approaches
- The evaluation of performances should be carried out through a “false positive / false negative” scoring as described below

Performances of algorithms	Algorithm: artefact is present	Algorithm: artefact is not present
Perceived artefacts by the viewer	True positive	False negative
No perceived artefacts by the viewer	False positive	True negative

thank you

Any comments ???

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References

Recommendation ITU-T P.10/G.100 : Vocabulary and effects of transmission parameters on customer opinion of transmission quality

Recommendation ITU-T J.246 Perceptual visual quality measurement techniques for multimedia services over digital cable television networks in the presence of a reduced bandwidth reference

Recommendation ITU-T J.247, Objective perceptual multimedia video quality measurement in the presence of a full reference

Recommendation ITU-T J.144 Objective perceptual video quality measurement techniques for digital cable television in the presence of a full reference

http://www.interrasystems.com/dms/pdf/BatonDatasheet.pdf
http://www2.tek.com/cmswpt/psdetails.lotr?ct=PS&cs=psu&ci=15260&lc=EN
http://www.vidcheck.com/products.asp#spec
http://www.telestream.net/pdfs/datasheets/dat-Vantage-Analysis.pdf
http://www.dcainc.com/products/aurora/index.html

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