Progress in Monitoring of Audio-Visual Quality by Key Indicators (MOAVI)

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Presentation Plan

• Reminder on Monitoring of Audio Visual Quality by Key Indicators (MOAVI)
• Current status
• Progress since last VQEG meeting
• Future work
Reminder on MOAVI

• Mission
  • “To collaboratively develop No-Reference models for monitoring individual audio-visual service quality artifacts”

• Goals
  • To develop set of key indicators describing service quality in general and by removing implementation constraint
  • To select subsets for each potential application
  • To concentrate on models based on key indicators contrary to models predicting overall visual quality
MOAVI Co-Chairs

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Signal-Based, No-Reference Indicators for Artifacts of Various Origin

- **Capturing Artifacts**: bluriness, exposure, interlace, etc.
- **Processing Artifacts**: blockiness, bluriness, flickering, reduced spatial and temporal resolution, etc.
- **Transmission Artifacts**: blackout, block loss, freezing, slicing, etc.
- **Displaying Artifacts**: blackout, slicing, etc.
Free MATLAB Audio-Video Quality Indicators Rolling Out Online at http://vq.kt.agh.edu.pl/
Commercial Deployment as NET-MOZAIC in NET-xTVMS System by NetResearch
Current Status
# Available Video Indicators

<table>
<thead>
<tr>
<th>Blockiness</th>
<th>Bluriness</th>
<th>Exposure</th>
<th>Interlace</th>
<th>Noisiness</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
<td><img src="image4.png" alt="Image" /></td>
<td><img src="image5.png" alt="Image" /></td>
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</table>

<table>
<thead>
<tr>
<th>Framing</th>
<th>Flickering</th>
<th>Blackout</th>
<th>Spatial Activity</th>
<th>Temporal Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image6.png" alt="Image" /></td>
<td><img src="image7.png" alt="Image" /></td>
<td><img src="image8.png" alt="Image" /></td>
<td><img src="image9.png" alt="Image" /></td>
<td><img src="image10.png" alt="Image" /></td>
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</tbody>
</table>
Available Audio Indicators

- Mute
- Clipping
Progress since Last VQEG Meeting
New Video Indicators

<table>
<thead>
<tr>
<th>Brightness</th>
<th>Contrast</th>
<th>Freezing</th>
<th>Block Loss</th>
<th>Slicing</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Brightness Image" /></td>
<td><img src="image2.png" alt="Contrast Image" /></td>
<td><img src="image3.png" alt="Freezing Image" /></td>
<td><img src="image4.png" alt="Block Loss Image" /></td>
<td><img src="image5.png" alt="Slicing Image" /></td>
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</tbody>
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Contribution to JEG-Hybrid

All indicators have been already contributed to JEG-Hybrid as all-in-one, easy-to-run binary executable.
Future Work
More Experimental Setups for Verification of Indicators

<table>
<thead>
<tr>
<th>Experimental Setup</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshold</td>
<td>Blockiness, Bluriness</td>
</tr>
<tr>
<td>MOS (ACR≈DCR)</td>
<td>Exposure, Noisiness, Block Loss, Freezing, Slicing</td>
</tr>
<tr>
<td>None but planned</td>
<td>Contrast, Brightness, Flickering</td>
</tr>
<tr>
<td>None and not planned</td>
<td>Interlace, Framing, Blackout, Mute, Clipping</td>
</tr>
</tbody>
</table>
Black Box

Video frames (e.g. HDMI) → MOAVI (black box) → Video frames (e.g. HDMI)
Lip Sync Indicator Implementataion

- Algorithm correlating detection of:
  - Lip movement
  - Voice signal

- Results:
  - Accuracy = 95.8%
  - F1 metric = 96.4%
  - Specificity = 72.3%

- First implementation planned by Autumn 2014