Redefining ITU-T P.912 Recommendation Requirements for Subjects of Quality Assessments in Recognition Tasks

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Problems of quality measurements for task-based video partially addressed in Recommendation ITU-T P.912

- Title: “Subjective Video Quality Assessment Methods for Recognition Tasks”
- Published: 2008
- Introducing:
  - Basic definitions
  - Methods of testing
  - Psycho-physical experiments

Section 7.3 (“Subjects”): “Subjects who are experts in the application field of the target recognition video should be used.”

Nevertheless, to best authors’ knowledge, expert viewer issue not well verified in specific academic research

Consequently, we compared groups of subjects assessing video quality for task-based video
Is **Subjects’ Proficiency** Necessary?

**Figure:** Do I really need to be a security officer in order to participate in a test checking my ability to read license plate numbers in compressed video?

- **Expert subject**
  - Costly (practitioner):
  - Police officer
  - Doctor
  - Difficult to hire

- **Non-expert subject**
  - Cheap (colleague/friend):
  - Student
  - Retired
  - Easy to hire
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Four Categories of Lighting Condition Scenarios

1. Outdoor, daytime light
2. Indoor, bright with flashing lights
3. Indoor, dim with flashing lights
4. Indoor, dark with flashing lights
Three Different Distances Used for Clips Creating

1. 5.2 meters for indoor scenarios
2. 10.9 meters for outdoor scenarios, objects close
3. 14.6 meters for outdoor scenarios, objects far
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Viewing Conditions of Room Where Test Took Place Following ITU-R BT.500-12 and ITU-T P.910

- Ratio of luminance of inactive screen to peak luminance: \( \leq 0.02 \)
- Ratio of the luminance of the screen, when displaying only black level in a completely dark room, to that corresponding to peak white: \( \approx 0.01 \)
- Maximum observation angle relative to the normal (this number applies to CRT displays, whereas the appropriate numbers for other displays are under study): 30°
- Ratio of luminance of background behind picture monitor to peak luminance of picture: \( \approx 0.15 \)
- Other room illumination: low
Arranged Viewing Conditions

Figure: Test environment
Example of User Interface

Figure: User interface for subjective target recognition task test performed
NTIA Test-Plan (1/2)

- NTIA performed the object recognition tests with two groups of viewers
- The Practitioner group
  - All subjects were volunteers and weren’t paid for the test
  - Most received invitational travel to Boulder, CO
  - All of them had experience in public safety, including:
    - Police
    - Firemen
    - EMS
    - Forensic Video Analysts
  - Very few were outside the range of 30-60 years old
  - Three had minor color vision problems — their results were not significantly different
The Non-Practitioner group

- Subjects having no experience in image recognition
- All subjects were paid through a temp agency to take the test
- None of them had experience in public safety
- Subjects had a wide variety of ages, but skewed young
- Two had minor color vision problems — their results were not significantly different
Subjects having no experience in image recognition
All subjects volunteers and weren’t paid for their job
None of them with experience in public safety area

Almost all subjects 20-25 years old
One of them with color vision problems — did no worse than other viewers so his results included
15540 answers were totally given in each experiment

Artur, some more slide text here!
Comparison developed for task-based video
Specifications amendments for ITU-T P.912 Recommendation developed
Consequently first sentence of Section 7.3 (“Subjects”) of ITU-T P.912 to get rephrased into: “Subjects who are motivated should be used.”
Assisting researchers of task-based video quality to identify subjects that will allow them to successfully perform psychophysical experiment required
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