IMG Work plan: Pre-test discussion

VQEG Plenary Meeting

Shenzhen, 14-18 October 2019

Pre-test results

Wuhan University

Yaosi Hu, Zhenzhong Chen

WUHAN UNIVERSITY

Subjective Test Setup

Subjects: 5 (3 female + 2 male)
non-expert
average age 23.8

Display Device: HTC Vive

SSQ

DMOS Distribution

1 Uniform QP22
2 Uniform QP32
3 Uniform QP42
4 Non-uniform
   6x3 tiles
   smooth transition
5 Non-uniform
   6x3 tiles
   abrupt transition

Distribution of individual ratings

1 Bad
2 Poor
3 Fair
4 Good
5 Excellent
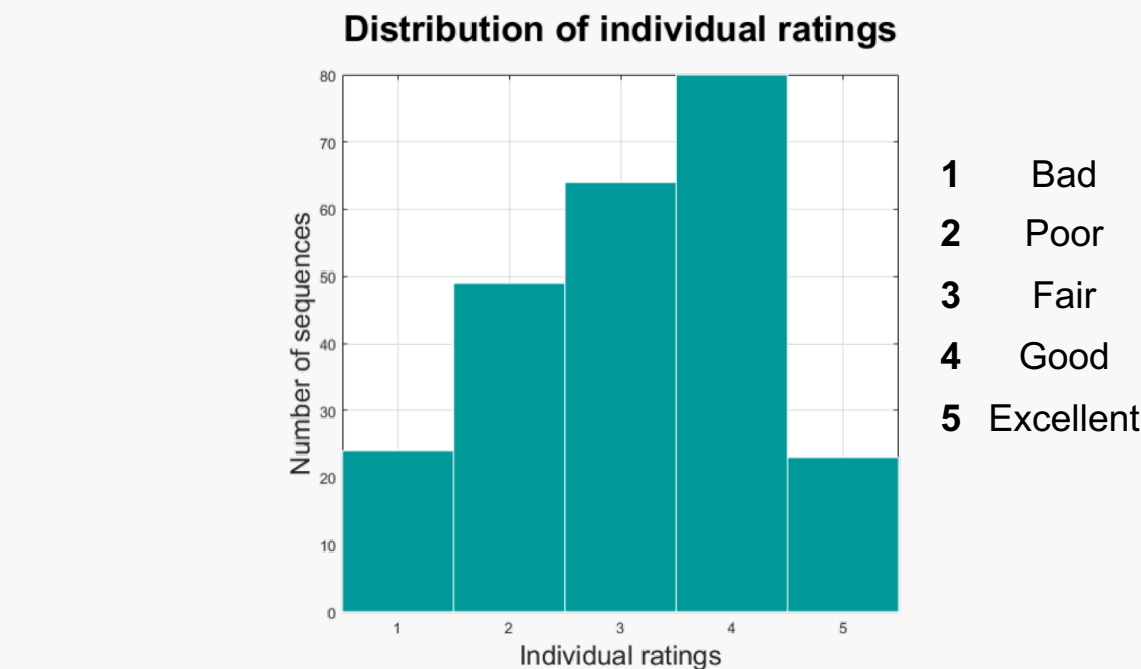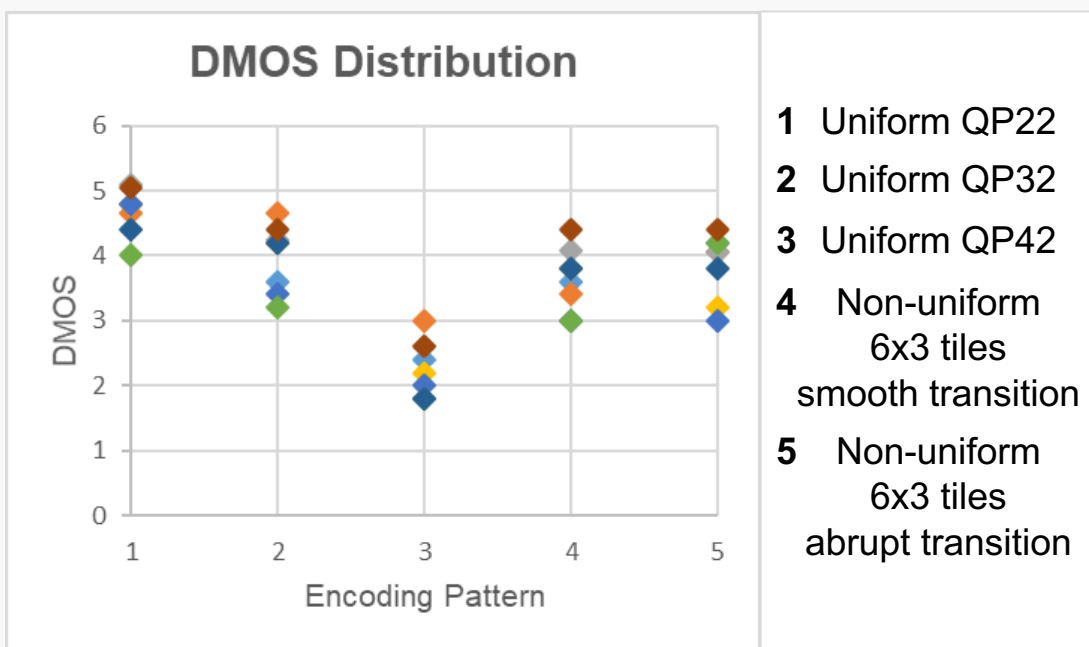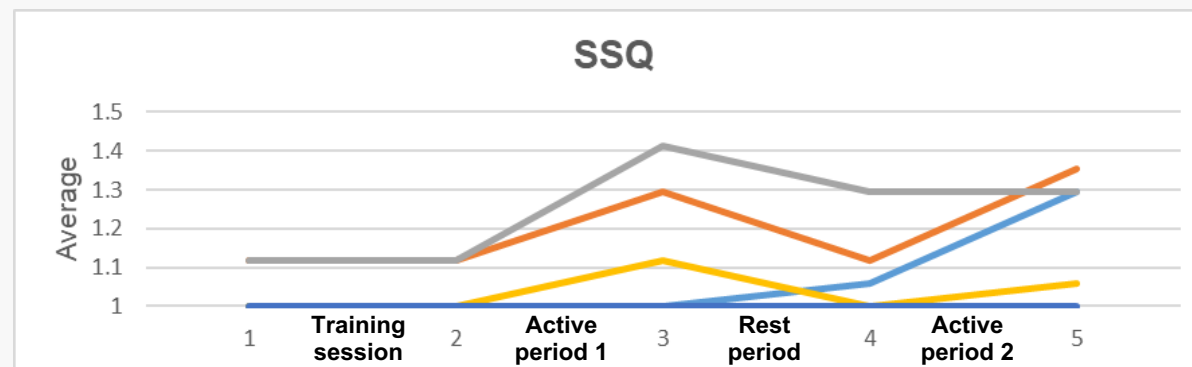
Pre-test SetB Results

Yaosi Hu, Zhenzhong Chen, Wuhan University

Feedback:

1. Subjects may feel confused when rating those non-uniform encoded sequences.

2. Subjects may not view the whole scene under free viewing. It may influence the rating for non-uniform encoded sequences.

More specific instruction?

Including non-uniform encoded example in training sequence?

Pre-Test Result Analysis Roma Tre

Set – A

Pramit Mazumdar, Federica Battisti, Marco Carli

COMLAB
Department of Engineering
Roma Tre University, Rome, Italy

Pre-test details

➢ Test Set **A**

➢ No. of Subjects: **4** (all male)

➢ **Device**: HTC Vive Standard

➢ **Laboratory**: COMLAB, Department of Engineering, Roma Tre, Italy

➢ **No problem** during entire Pre-test with 4 subjects

Suggestions

➢ Duration for each video is very short. So it is difficult to differentiate between two separate QPs of a same video. This effects the rating on quality.

➢ Observed that the subjects do not explore the total content (short duration/monotonous/subject is fatigued).

➢ Subjects are filling the same questionnaire five times during test. Their inputs are very important for our analysis. This should be categorically mentioned in the Instructions. Else we observed the subjects to be very reluctant in answering the questionnaire. For example, one subject told that No I am not going to fall down, and hence gave NONE to Vertigo. But he didn't think about the other two levels *Slight* and *Moderate,* which are in between None and Severe.

Sickness Analysis

➤ *Headache*, *Eye strain*, and *Fullness* of *head* mostly observed during entire Pre-test session.

➤ After Phase 2, subjects observe the highest level of *discomfort*.

➤ *General discomfort* observed after the training phase till the end of phase 2.

➤ After Phase 2 (i.e. after subjects watched videos for ~20 minutes) the following are observed:
  ❑ Fatigue
  ❑ Headache
  ❑ Eye Strain
  ❑ Difficulty Concentrating

Sickness Level over total Pre-test session

None = 1
Slight = 2
Moderate = 3
Severe = 4

Headache Average = 1.75
(*Slight* headache)

Symptom	Average over entire Pre-Test	After Phase 2
Headache	**1.2**	**1.75**
Fullness of head	**1.05**	**1.5**
General discomfort	**1.15**	**1.25**
Eye strain	**1.2**	**1.75**
Fatigue	**1.2**	**1.5**
Difficulty focusing	1.15	1.25
Difficulty concentrating	1.05	1.5
Increased salivation	1.1	1.25
Dizzy (eyes closed)	1	1.25
Stomach awareness	1	1
Sweating	1.1	1.25
Nausea	1.05	1
Blurred vision	1.05	1.25
Dizzy (eyes open)	1	1
Vertigo	1.05	1
Burping	1	1

Video Quality Rating for QP selection

Video Sequence	Best Rated QP	Average Rating
Brazil Music	**QP 22**	4.25
Cheer Leading	**QP 22**, QP 27	3.75
Nokia FLAMENCO	QP 15, **QP 22**, QP 27, QP 32	4.25
Nokia SEGOVIA	QP 32	3.75
Nokia DOJOZENTRUM Mono	QP 37	3
Thievesat Lake	**QP 22**_6x3_abrupt, QP 32	3
VSENSE Luther	QP 32	3.5
VSENSE Vaude	**QP 22**_8x5_gradual, **QP 22**_8x5_abrupt	3.5

Audiovisual Technology Group
TU Ilmenau

Ashutosh Singla, Alexander Raake

Results
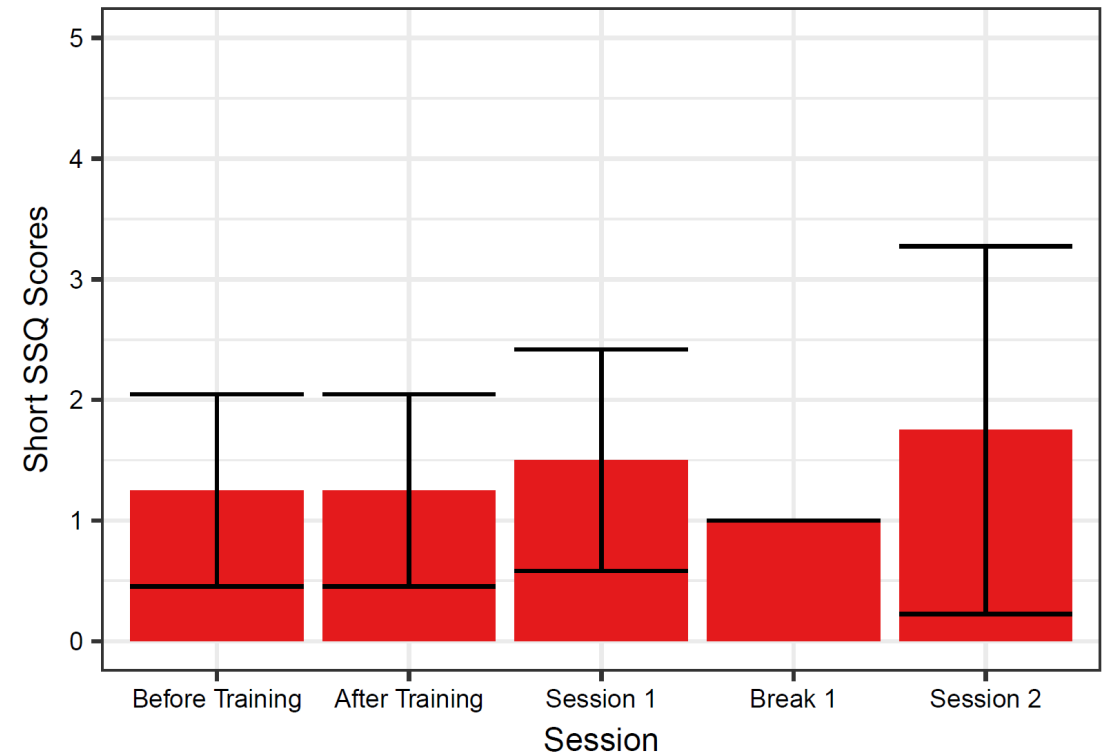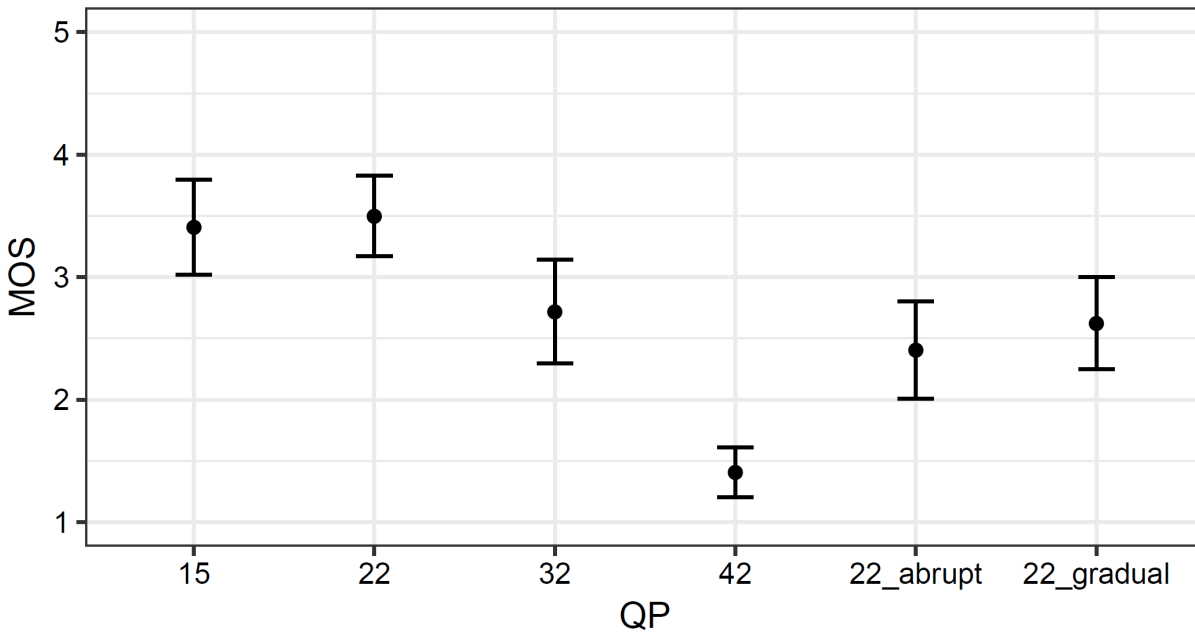
Results of Long Simulator Sickness Questionnaire
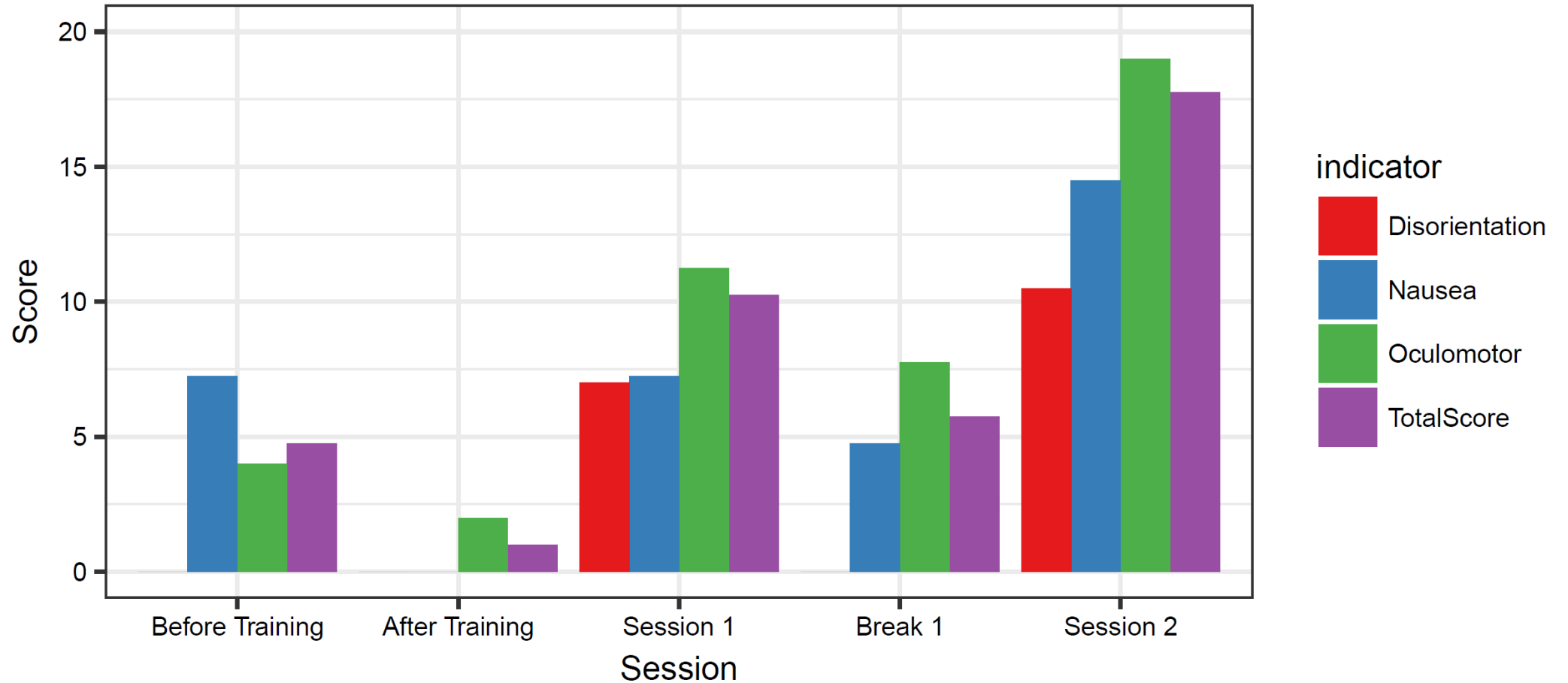
VQEG-IMG Pre-test
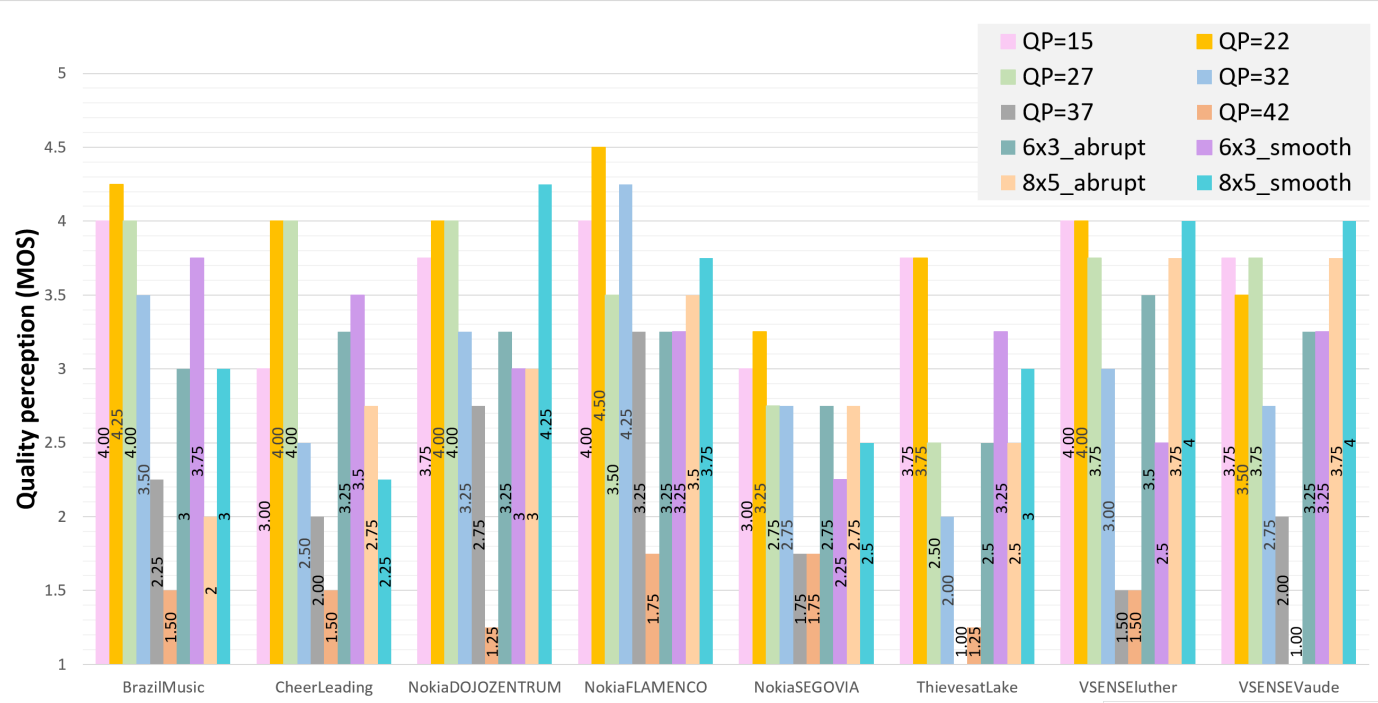
VQEG Shenzhen 2019

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Universidad Politécnica de Madrid

[†]Nokia Bell Labs
Madrid

Quality

SET B
4 users
Samsung 8 + Samsung Gear VR

SET A
4 users
HTC Vive
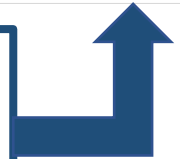
- HR MOS ~ 4
- Some sources have MOS < 3
  - Source (stitching) artifacts too visible?
  - Consider replacing (some of) them
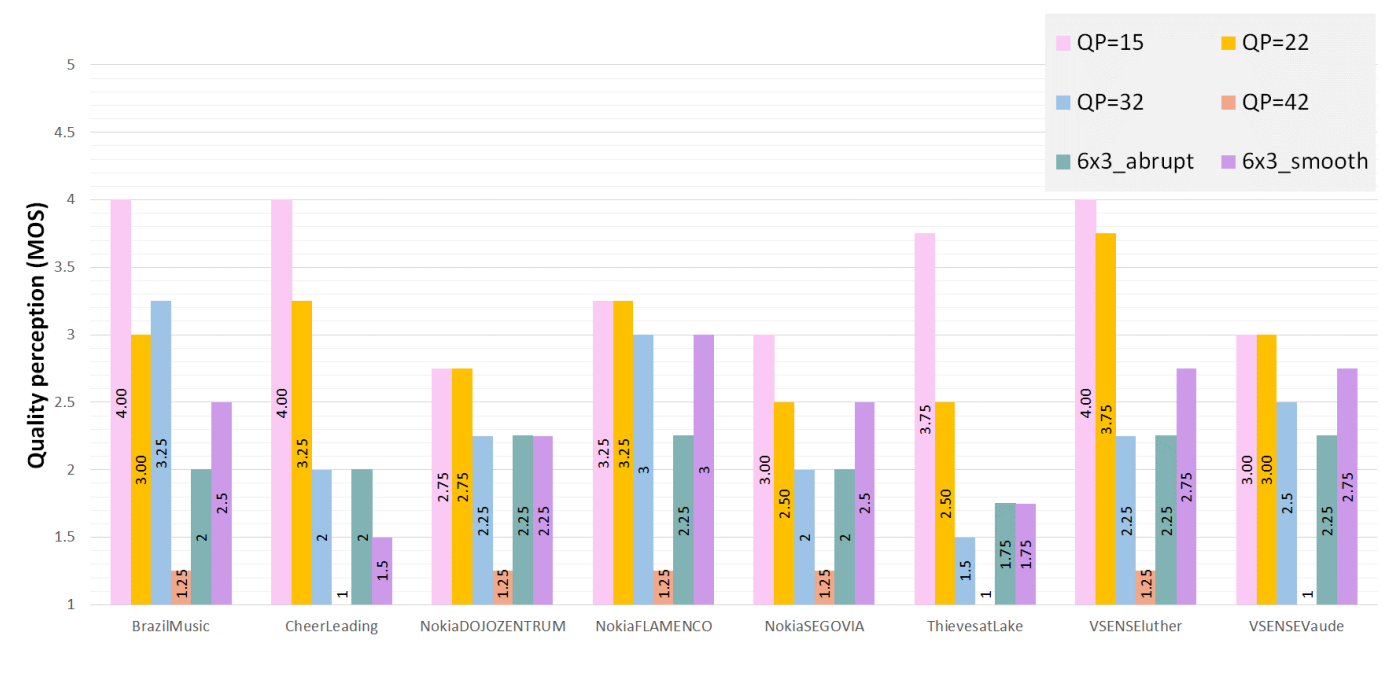
SSQ
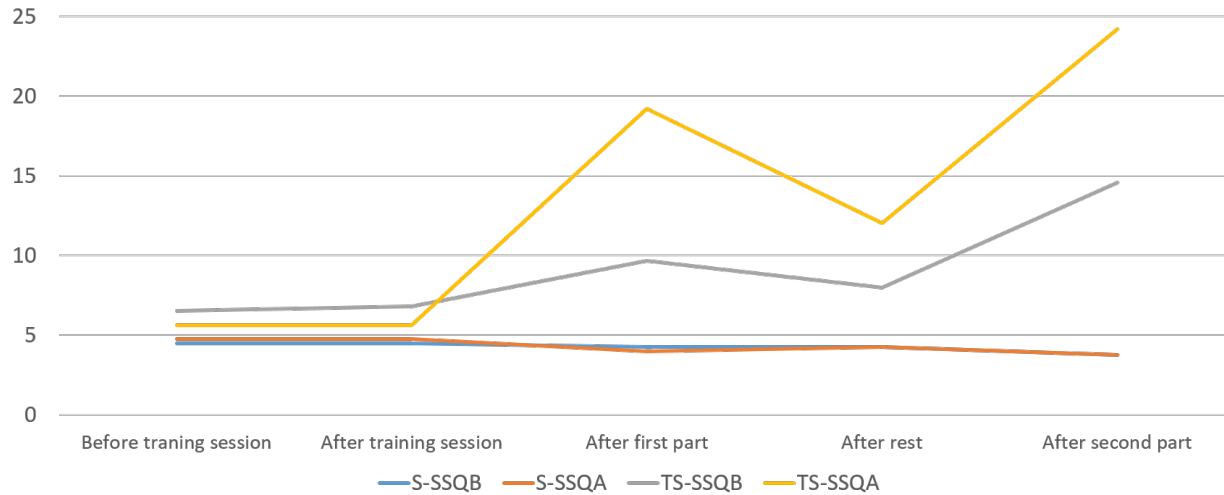
- Mean SSQ in each measuremen point
  - Cummulative
  - Rest period seems effective
  - No change before/after training session (remove one point?)
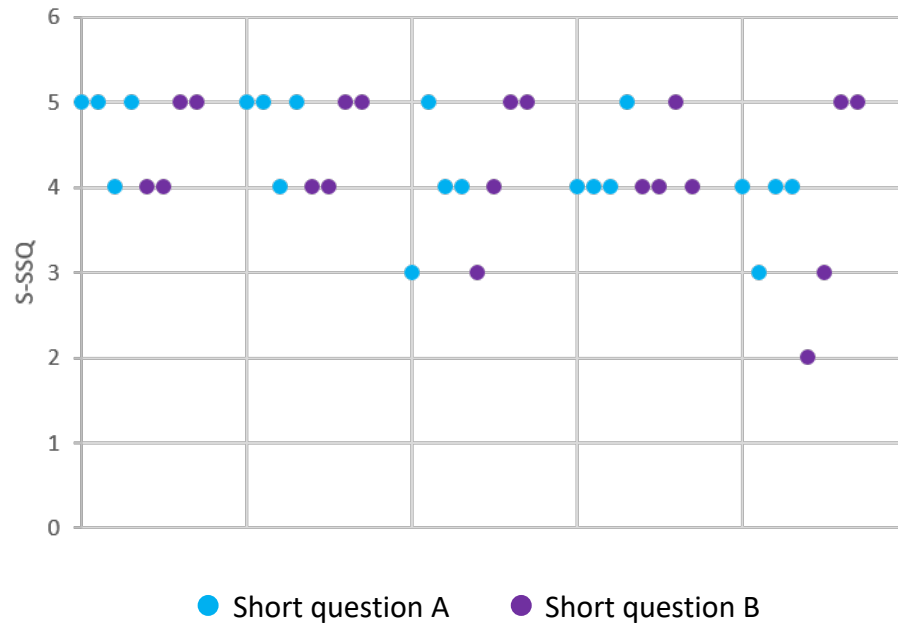
- SSQ vs short-SSQ
  - No obvious correlation
  - No obvious difference between short questionnaires
  - More tests needed

Other issues / change requests

- Issues
  - Head orientation coordinates are not the same in Mobile vs Desktop versions of the app
  - Sequences do not start at center position (desktop app only)
  - One PVS has coding issues
  - Playlist change is tedious

- Improvements needed in Miro360:
  - Implementation of playlist selection
    - Idea: load playlists from server (web page control)
  - Implementation of DCR
  - Support for stereoscopic content

VQEG IMG PRE-TEST

Glenn Van Wallendael

GHENT
UNIVERSITY

Results

1. Timing of the test is underestimated: 50 min for each participant

2. Only Light effects: Slight discomfort, but no sickness

3. RAW scores and summery in excel sheet

GHENT
UNIVERSITY

Feedback

1. Rotating the rating scale conflicts with the ROI of 90, 120 and 180 degrees. These ROI PVS assume a region of interest in front of you so rating the sequences every time in front of you would be advantageous.

2. The ROI is sometimes not positioned towards the actual region of interest. Mainly visible in the NokiaSEGOVIA_3840x2160_30. There is a street going from left to right with people and the ROI is towards a closed shop.

3. For some sequences, the ROI concept is strange, namely for the ones where there is interesting scenes all around: BrazilMusic_4096x2048_25, CheerLeading_4096x2048_25, NokiaDOJOZENTRUMmono_3840x2160_30 and NokiaFLAMENCO_3840x2160_30

GHENT
UNIVERSITY

Feedback

1. The wire on the HTC Vive was sometimes annoying, UGent could do tests without if there is interest?

2. BrazilMusic_4096x2048_25 is not as loud in volume as the others.

3. There seems to be packet loss errors in the NokiaDOJOZENTRUMmono_3840x2160_30 sequence. Is this on purpose?

4. The playback of the NokiaSEGOVIA_3840x2160_30 sequence starts a little too early such that several milliseconds of the previous scene are visible.

University of Surrey

Femi Adeyemi-Ejeye

Brazil Music

QP	Tiles	Transition	ACR Mean
22	6x3	abrupt	4
22	8x5	abrupt	3.5
22	6x3	gradual	4
22	8x5	gradual	2.75
15			4.25
22			4.25
27			4.25
32			3.25
37			2.75
42			2.75

CheerLeading

QP	Tiles	Transiti	ACR Mean
22	6x3	abrupt	3.75
22	8x5	abrupt	4
22	6x3	gradual	2.75
22	8x5	gradual	3.5
15			4
22			4
27			4.5
32			4
37			3
42			2

DojozentrumMono

QP	Tiles	Transiti	ACR Mean
22	6x3	abrupt	3
22	8x5	abrupt	2.75
22	6x3	gradual	4
22	8x5	gradual	4.75
15			3
22			3.25
27			2.5
32			2.75
37			2.5
42			2.5

Flamenco

QP	Tiles	Transiti	ACR Mean
22	6x3	abrupt	4
22	8x5	abrupt	3.5
22	6x3	gradual	4
22	8x5	gradual	4.25
15			4
22			4
27			4
32			3.75
37			4
42			2.75

Segovia

QP	Tiles	Transiti	ACR Mean
22	6x3	abrupt	3.25
22	8x5	abrupt	2.75
22	6x3	gradual	2.75
22	8x5	gradual	2.75
15			4.5
22			3.75
27			2.5
32			4.25
37			3.75
42			2.5

ThievesatLake

QP	Tiles	Transiti	ACR Mean
22	6x3	abrupt	4.5
22	8x5	abrupt	4
22	6x3	gradual	3
22	8x5	gradual	2.75
15			4.25
22			4.5
27			3.5
32			4
37			4
42			1.5

Luther

QP	Tiles	Transiti	ACR Mean
22	6x3	abrupt	3.25
22	8x5	abrupt	4.5
22	6x3	gradual	3
22	8x5	gradual	4.5
15			4.5
22			4.75
27			4.5
32			3.5
37			2.5
42			2.25

Vaude

QP	Tiles	Transiti	ACR Mean
22	6x3	abrupt	3
22	8x5	abrupt	3
22	6x3	gradual	3
22	8x5	gradual	4.5
15			3.75
22			4.25
27			3.5
32			4.5
37			2.25
42			2.25

SSQ

Question	Mean answer 1	Mean answer 2	Mean answer 3	Mean answer 4	Mean answer 5
Are you feeling any sickness or discomfort now?	1.25	1.25	1.25	1.25	1.75
General discomfort	1.25	1.25	1.25	1.25	1.5
Fatigue	2	2	2	2	2
Headache	1	1	1	1	1.5
Eye strain	1	1	1.75	1.5	1.75
Difficulty focusing	1.5	1.5	1.5	1.5	1.5
Increased salivation	1	1	1	1	1
Sweating	1	1	1	1	1.75
Nausea	1	1	1	1	1.5
Difficulty concentrating	1.5	1.5	1.5	1.5	1.5
Fullness of head	1	1	1	1	1
Blurred vision	1	1.25	1.25	1.25	1.5
Dizzy (eyes open)	1	1.25	1.25	1	2.25
Dizzy (eyes closed)	1	1	1	1	1
Vertigo	1	1	1.25	1	1.75
Stomach awareness	1.25	1.25	1.25	1.25	1.75
Burping	1	1	1.5	1	1

Pre-test results from CWI (set B)

Irene Viola, Pablo Cesar

irene@cwi.nl
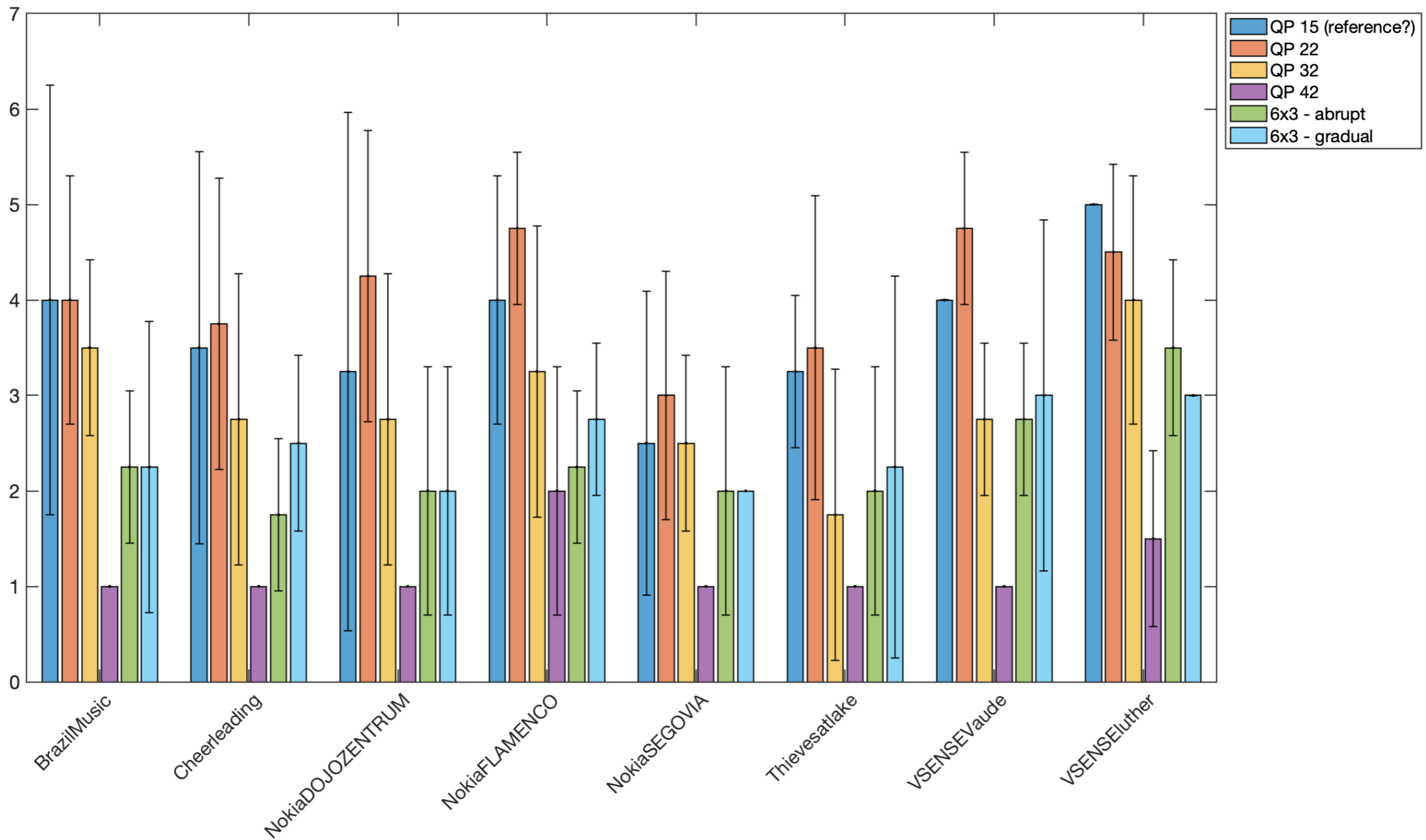
- QP 15 and 22 achieve the same quality rating
- Between non-uniform approaches, there's statistical equivalence
- Among sequences, NokiaSEGOVIA is the lowest rated (max MOS = 3)

Short-SSQ results per participant
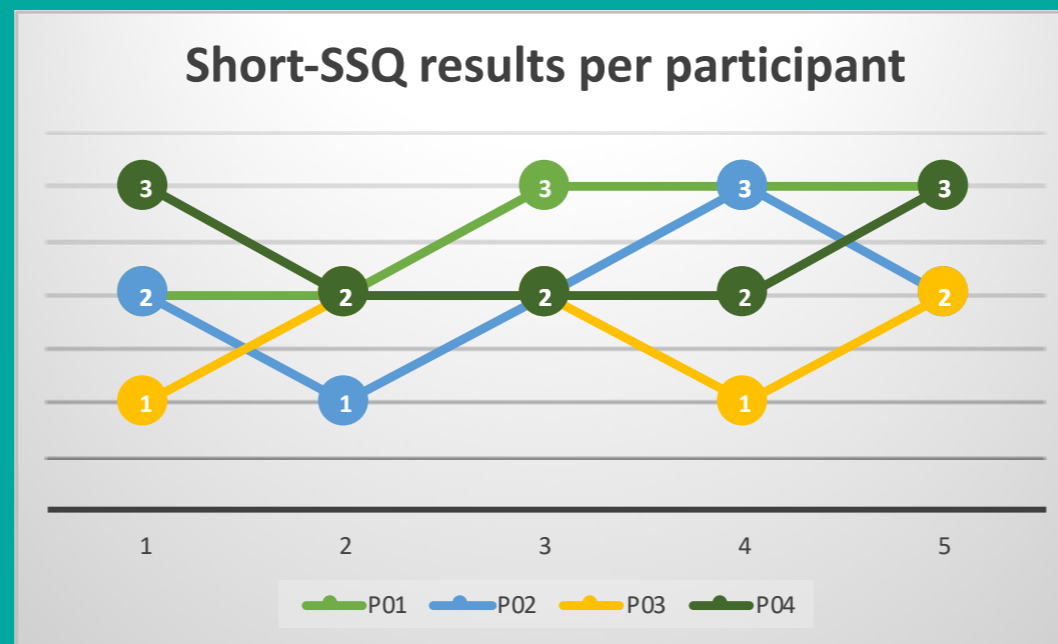
- No participant reported values higher than 3 in both short and long questionnaire

- One participant (P03) reported 1 for all the questions in the long questionnaire, but reported some 2s for the short one

- In general, break between sessions sometimes helped ease sickness symptoms - P02 being the only one reporting worse symptoms after the break (might be outlier behaviour)

Remarks

- Training is too short - adding 1-2 examples of middle quality might help

- Training should specify that participants need to rate the sequence as whole (to account for "weird transitions" as they were called by participants)

- It would be good to explicitly say to discard artefacts that are not due to compression (vanishing parts, stitching artefacts etc)

- Explicitly specify how audio should be played (had to discard one participant because the session was run without audio)

- Adding recommendations on how to perform the training and the test - swivel chair, wifi headphones etc.

IMG Pretest
360 video quality

Kjell Brunnström, John Hedlund, Thomas Maier

Research Institutes of Sweden

RISE ICT

Pretest RISE

- 4 test subject (3 males and 1 female. Age: 48, 29, 28 and 16)

- HMD: HTC Vive

- 30 s video clips (set B)

- Overall impression is that the design works

- Instructions seemed clear enough (subjects seemed to have understood)

- Training: possibly a bit short. Maybe add an intermediate quality video

Pretest RISE

- Session length: OK

- Missing: pre- and postquestionnaire

- Voting screen would be better to be more stable and presented if possible centered in view.

- Use of different startup-files for different sessions. Now we copied the whole program to get training, session 1 and session 2 (maybe we missed something???)

RI.
SE

THANK YOU!

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Research Institutes of Sweden

RISE

Next steps – discussion