Annex I. Added Value Questionnaire

Advisory board online questionnaire

Introduction

The goal of this questionnaire is to help us steer the VR-Together project to achieve the highest impact.

We are well aware of the current state of VR. Games on the one hand and 360° videos on the other are the main VR types of content available today. Technology is improving rapidly, such as headset and camera quality. Adoption by consumers, in an absolute sense, is still low and mostly based on mobile phones in enclosures, but adoption in relative sense is growing quickly. The quality of content offered is increasing rapidly, as the creative industry is gaining experience with creating VR experiences. Still, the big question in the VR industry is how to offer real added value for users to justify both buying a headset and actually using it. VR-Together is focussing on two main concepts:

1. Delivering high-quality photo-realistic content for a strong feeling of immersion. Being there.
2. Creating a strong feeling of co-presence in VR experiences. Being there together!

VR content experiences	**360° (3DOF)**	**Full VR (6DOF)**
Alone	current experiences adding higher realism	points clouds, Time Varying Meshes (TVMs), character animation (for interactive experiences)
Together	Adding social, based on current videoconferencing Adding live presentation of others	**VR-Together**

Given the diversity of the advisory board, not all questions are expected to be answered by everyone. Please answer the questions to the best of your ability, and skip questions where you consider that they are not part of your own expertise. In such a case, please also leave a short remark on why you haven't answered, in the open comments part of the section.

VR market

The VR-Together project is making a contribution to the development of new VR experiences. To this end, we strive to ensure that what we develop, is usable by the industry. Having a project runtime reaching Q4 of 2020, we pursue to create advancements that will be of interest to the industry in that timeframe.

In your opinion, when do you expect the consumer use of VR to reach a critical mass?

(now, 2020, 2022, 2025, beyond 2025)

What are in your opinion the most important VR applications for consumers:

(range: unimportant, of little importance, moderately important, important, very important)

- VR Gaming
- 360° Movies / TV shows
- News/sport: experience live news and sport events as being there
- Social networking in VR environment
- Shopping: see goods in actual environment

- Dating
- Other, please add your own [fill in]

When do you expect the business use of VR to really start growing rapidly?

(now, 2020, 2022, 2025, beyond 2025)

Where do you expect VR to be the most applicable?

[not applicable, somewhat applicable, moderately applicable, applicable, very applicable]

- Healthcare
- Education / training
- Engineering
- Military
- Sport
- Construction
- Tourism
- Media & entertainment
- ICT and telecommunication
- Retail
- Business services
- Research
- Other, please add your own [fill in]

What are the main uses of VR for companies:

[range: unimportant, of little importance, moderately important, important, very important]

- Product design
- Remote collaboration
- Training
- Research/visualisation
- Marketing
- B2C interaction
- Other, please add your own [fill in]

What do you think are the biggest challenges which still need to be tackled for the VR market?

[free comment box]

What are your own key insights in this area of creating or implementing VR solutions?

[free comment box]

Any other comments here: [free comment box]

VR content experiences & Social VR experiences

Driven by the popularity and reduced cost of current-gen VR, many media companies are now diving into VR, looking into the possibilities it offers and where it adds the most value. These companies greatly benefit from partnering with technology providers for reaching end-users. Within this market context, various online companies such as Facebook, AltspaceVR, Sansar and Bigscreen offer social VR services. In these, users can meet as virtual avatars and talk together, watch movies together, play games together, etc.

Which types of content do you think are most suitable for VR:

[not suitable, somewhat suitable, moderately suitable, suitable, very suitable]

- Live Sports
- Live Music
- Live News
- Movies
- TV shows
- TV series
- Travel
- Animation
- Lectures / keynotes
- Other, please add your own [fill in]

And, which types of content will have the most benefit from experiencing it together, e.g. with partner, family, friends?

- Live Sports
- Live Music
- Live News
- Movies
- TV shows
- TV series
- Travel
- Animation
- Lectures / keynotes
- Other, please add your own [fill in]

Any other comments here: [free comment box]

2D vs 3D user representation

We expect that ultimately, high quality photo-realistic 3D representations of users will produce a better user experience. The same applies to the environment, where we have a range of 360° monoscopic, 360° stereoscopic and full 3D photo-realistic environments (i.e. 6DOF). We expect that highly realistic 3D scenes offer the strongest degrees of immersion. But, given the constraints of real-time communication (i.e. maintaining an end-to-end delay below 500 milliseconds) and the scope of the project (i.e. using off-the-shelf consumer hardware components), creating a highly realistic 3D representation of users is a major challenge. Furthermore, given the goal of reaching a highly scalable distribution system, delivering high-quality 3D content poses an additional challenge.

In the case of VR-Together, 3D refers to streaming point cloud or time varying meshes. In this, we try to strive for a balance between quality, applicability (in terms of costs, mostly) and timing.

When do you expect that the quality of experience of 3D video is similar to current-generation 2D video?

(now, 2020, 2022, 2025, beyond 2025)

When would you expect 6DOF video to be usable for consumer media experiences?

(now, 2020, 2022, 2025, beyond 2025)

When would you expect that real-time 6DOF streaming will arrive?

(now, 2020, 2022, 2025, beyond 2025)

Where important do you consider increasing the quality (as experienced by users) of the following aspects of user representations to achieve improved immersion:

[range: unimportant, of little importance, moderately important, important, very important]

- Video in 2D representation
- Video-based textures in 3D representation
- 3D models in 3D representation
- Point clouds in 3D representation
- Recorded audio
- Audio spatiality

Any other comments here: [free comment box]

Artistic aspects

When capturing images for 3D reconstruction and CGI, there is a distinction between capturing dynamic objects (e.g. actors, moving objects) and static objects (e.g. static furniture and the environment).

[range: unimportant, of little importance, moderately important, important, very important]

How important do you consider using CGI techniques for simulating real objects?

How important do you think animating physical behaviours and actions by actors is for immersing end-users?

The advantage of capturing environments in 3D, is that elements can be added in post-production. For example, this allows tweaking of lighting conditions and adding/removing/modifying objects after a capture has been performed.

[range: unimportant, of little importance, moderately important, important, very important]

How important do you deem the post-processing of lighting and color correction to reach a photo-realistic result?

Please evaluate the importance of the following rendering technologies for obtaining a photo-realistic result:

[range: unimportant, of little importance, moderately important, important, very important]

· Physical Based Rendering

· Light diffusion

· Global Illumination

· Ray-traced rendering

· AI-assisted rendering

· Subsurface Scattering

· HDR rendering

· Physics-based Rendering

Distribution chain components

The VR industry as a whole is moving forward, many companies are working on various aspects of VR content capture, production, distribution and rendering. Production can be split into two topics: orchestration (both spatial and temporal) and encoding. For our project, it is important to work on topics that will ultimately benefit the industry. What is in your opinion the importance of our current topics:

(range: unimportant, of little importance, moderately important, important, very important)

- 3D capture, i.e. 3D reconstruction based on multiple (off-the-shelf) cameras
- Encoding of point clouds and TVMs (time varying meshes)
- Delivery of point clouds and TVMs
- Rendering of point clouds and TVMs
- Spatial audio capture, encoding and playout
- Temporal orchestration, i.e. media synchronisation between various content parts and across various simultaneous users
- Spatial orchestration, i.e. scene construction, creating the VR experience
- Optimization for bandwidth, scalability and resilience of the end-to-end chain
- Other: please add your own [fill-in]

Any other comments here: [free comment box]

Various aspects

There are various aspects that are currently in scope of the project. Please indicate the importance of these various aspects on a (Social) VR experience:

(range: unimportant, of little importance, moderately important, important, very important)

- User self-view, i.e. that a user sees his/her self
- HMD removal, i.e. that in the representation you see of other users, the HMD in the image is replaced with a reconstructed image of the users face and eyes
- Interaction capabilities with the scene, e.g. have the ability to move objects
- Live content distribution, e.g. for sports events.
- PC-based VR experience
- Mobile-based VR experience
- Web-based VR experiences
- Native application VR experiences
- Spatial audio
- Multi-user (>2) interaction
- Other: please add your own if you feel we missed something [fill-in]

Any other comments here: [free comment box]

Missing aspects

There may be aspects for end-to-end social VR which are currently out of scope of the project. Please indicate the importance of such aspects on a (Social) VR experience:

(range: unimportant, of little importance, moderately important, important, very important)

- Haptics
- Tracked controllers
- World-scale VR
- Interaction with the environment: sounds, smells, objects to touch

- Other: please add your own [fill-in]

Core focus of the project

Currently, the project has a focus on various topics, focusing on core technical development of components, large-scale measurements on delay/bandwidth/quality, platform integration, user experience tests, real-world trials, market analysis. Can you indicate what you think is important for the project to focus on:

(range: unimportant, of little importance, moderately important, important, very important)

1. core technology development
2. large-scale technical measurements on delay, bandwidth, quality
3. platform integration, i.e. combining core technologies in complete working setups
4. photorealistic 3D content production
5. user experience measurements
6. real-world trials
7. market analysis

Do you see specific combinations of these as particularly valuable?

1+3, not only creating components but also showing that everything works together as a whole

2+5, looking at the dependencies between technical parameters on the one hand and quality of experience of users on the other hand

6+7, looking into where we expect the market to be heading, and actually moving forward in expected directions to validate this.

Or any other combination? [free comment box]

Any other comments here: [free comment box]

Dissemination & exploitation strategy

For an EU project to ultimately bring benefit to the broader industry, we are actively disseminating our results. We are bringing our work to conferences, trade shows, standardisation bodies, and are in direct contact with various companies, discussing our vision and talking about field trials and the value of our various components.

Can you please indicate how important you find these various routes:

(range: unimportant, of little importance, moderately important, important, very important)

- Technical / academic conferences, e.g. IEEE & ACM conferences.
- Industry events / trade shows, e.g. IBC, VR Days, VR world congress.
- Standardisation, e.g. in MPEG, 3GPP, W3C, DVB.
- Direct industry contact, e.g. working towards field trials and component integration.
- Other: please add your own [fill-in]

Any other comments here: [free comment box]

Final remarks

Do you have any other remarks you wish to make, any feedback or advice to give us?

[free comment box]

Annex II. CWI-1 Questionnaires and Forms

Consent Form

Please read the following information carefully before deciding to participate in this experiment.

This experiment is part of a research on quality perception of point cloud imagery. There will be two parts of the experiment, each part taking 15-20 minutes.

In the first part, you will be shown point cloud images in pairs. You will then be asked to rate the quality of the image on the right side of the screen, with respect to the image on the left side of the screen.

In the second part, you will be asked to group the point cloud images that you have seen based on similarity in quality, and explain the reasoning behind your grouping of the images.

There may be slight fatigue from looking at the images on the screen. Please keep in mind that you are free to take a break anytime, and end the experiment if needed. We do not share any personal information that you give us.

If you have any questions or comments about this experiment, please contact Ernestasia Siahaan via E.Siahaan@tudelft.nl.

☐ **I agree to take part in this experiment. I understand the risks that may arise from participating in this experiment, and that I am free to leave the experiment at any point.**

Name:

Date:

Signature:

Annex III. CERTH-4 Form

CONSENT FORM TO PARTICIPATE IN RESEARCH

CONSENT TO PARTICIPATE IN THE RESEARCH CONDUCTED WITHIN THE VRTOGETHER PROJECT

INFORMATION

GENERAL INFORMATION

A. Data Controller:

Dr. Petros Daras, Researcher A'; Building B – Office 0.19 (and Building A – Office 2.10); Information Technologies Institute; Centre for Research & Technology – Hellas; 1st km Thermi – Panorama, 57001, Thessaloniki, Greece; Tel.: +30 2310 464160 (ext. 156) and +30 2311 257755; Fax: +30 2310 464164; Email: daras@iti.gr.

B. Data Controller's Representative:

Mr. Spiros Thermos, Research Assistant; Building B – Office 0.3; Information Technologies Institute; Centre for Research & Technology – Hellas; 1st km Thermi - Panorama, 57001, Thessaloniki, Greece; Tel.: +30 2310 464160 (ext. 142); Fax: +30 2310 464164; Email: spthermo@iti.gr.

C. Data Protection Officer (DPO):

Mr. Ioannis Chalinidis; Technical Services Building – 1st Floor; Centre for Research & Technology – Hellas; 6th km Harilaou – Thermi, 57001, Thessaloniki, Greece; Tel.: +30 2310 498133 (ext. 133/132); Fax: +30 2310 498220; Email: ivchal@certh.gr.

D. Purpose(s) and Legal Basis of Personal Data Processing

Main purpose of processing is research within the scope of the VRTogether project; Specifically, training and evaluating computer algorithms towards efficient, real-time Head-Mounted Display (HMD) 'virtual removal'.

Secondary purpose of processing is the creation of a scientific dataset that will be shared publicly online (public dataset) for research purposes only. ***However, you should be aware that once the material is made available online, it will get out of our absolute control and we will not be able to prevent other illicit uses of it.***

Legal basis for processing is the General Data Protection Regulation (GDPR)[1] and specifically Article 89.

E. Personal Data Retention Period

Personal data will be stored until 30 September 2025 (five years after the end of the VRTogether project).

F. Your (Data Subject) Rights

[1] Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)

Participants should be given two copies of the present consent form – one to keep, and one to sign and return to the Data Controller's Representative.

You (the data subject) have the right to request from the controller access to (GDPR[1], Article 15) and rectification (GDPR[1], Article 16) or erasure (GDPR[1], Article 17) of personal data or restriction of processing concerning the data subject or to object to processing (GDPR[1], Article 18) as well as the right to data portability (GDPR[1], Article 20), ***subject to derogations relating to processing for scientific research (GDPR[1], Article 89, Paragraphs 1, 2, and 4).***

a. Your (Data Subject) Specific Right to Withdraw Consent at Any Time

You (the data subject) have the right to withdraw consent at any time, ***without however affecting the lawfulness of processing based on consent before its withdrawal.***

b. Your (Data Subject) Specific Right to Lodge a Complaint with a Supervisory Authority

You (the data subject) have the right to lodge a complaint with a supervisory authority.

INFORMATION ON THE STUDY/EXPERIMENT TO BE CONDUCTED

"An end-to-end system for the production and delivery of photorealistic social immersive virtual reality experiences" or simply **VRTogether** (http://vrtogether.eu/) is a media project funded by the **European Commission** as part of the **H2020 program** (https://ec.europa.eu/programmes/horizon2020/), under the grant agreement 762111. It will last for **3 years** (From 2017-10-01 to 2020-09-30) and operate with a budget of 3.9M€.

Within VRTogether a study is conducted for capturing visual (videos) and depth map data of users not wearing and wearing a Head-Mounted Display (HMD), that will be then used for training and evaluating computer algorithms towards efficient, real-time HMD 'virtual removal'.

INFORMATION ON THE PERSONAL DATA TO BE COLLECTED

Visual (video) and depth map data of the upper body of users not wearing and wearing a Head-Mounted Display (HMD). The users will be captured sitting, performing various facial expressions; every user will be captured for 2 minutes.

CONSENT

I, the undersigned, hereby declare:

- ☑ **that I have carefully studied and understood the above information;**
- ☑ **my consent to participate in the study/experiment conducted within the EU co-funded research project VRTogether (No.: 762111).**
- ☑ **my consent to the processing of my personal data for the main purpose detailed in point D above;**
- ☑ **my consent to the processing of my personal data for the secondary purpose detailed in point D above; I confirm that I am aware that once the material is made available online, it will get out of the absolute control of the Data Controller and he will not be able to prevent other illicit uses of it.**

DATE _____ _____ NAME

_____ SIGNATURE

Participants should be given two copies of the present consent form – one to keep, and one to sign and return to the Data Controller's Representative.

Annex IV. Consent Forms in ARTANIM Experiments

FORMULAIRE D'INFORMATION

Promoteur de l'étude : Fondation Artanim
Protocole : « Effet de l'auto-animation sur la présence ».

Madame, Monsieur,

Nous vous proposons de participer à une étude qui a pour but d'évaluer l'impact de différents niveaux de fidélité d'animation du corps sur le sentiment d'immersion dans un environnement virtuel.

Buts de l'étude

Le but de l'étude est d'évaluer dans quelle mesure différents niveaux de fidélité d'animation du corps et du visage (yeux, regard, bouche) ont un impact sur le sentiment d'immersion dans un environnement virtuel.

Description et déroulement de la participation

Votre participation à cette recherche consiste à participer à une session de capture de mouvement, d'une durée d'environ 1 heure. Vous serez équipés de marqueurs (petites sphères recouvertes de bandes réfléchissantes) fixés à une combinaison permettant d'enregistrer vos mouvements. Le suivi des marqueurs se fait par des caméras infrarouges placées autour de vous. Il est important de noter que le rayonnement infrarouge est indolore et ne comporte aucun risque, notamment pour les yeux.

Vous serez également équipés d'un casque de réalité virtuelle qui vous permet de vous immerger dans un environnement virtuel. Dans cet environnement, vous aurez à vous y déplacer et à exécuter certaines tâches comme d'interagir avec des objets virtuels.

A la fin de cette session, vous serez finalement amenés à remplir des questionnaires sur la présence (sentiment d'immersion) et la personnification.

Pour cette étude, les données récoltées seront analysées et traitées par ordinateur ce qui ne requiert pas votre présence.

24 volontaires sont recherché(e)s pour cette étude.

Bénéfices associés à l'étude

Cette étude n'engendra aucun frais à votre charge. L'analyse de vos données récoltées nous aidera à :

- Identifier les techniques d'animation permettant d'améliorer le degré d'immersion d'un utilisateur dans un environnement virtuel.
- Obtenir des données quantitatives sur l'immersion et la personnification dans des environnements virtuels.

Ces résultats pourraient faire l'objet de publications scientifiques et de présentations à des congrès. Ces publications et ces présentations respecteront rigoureusement la confidentialité et l'anonymat des données.

Risques potentiels

La capture de mouvement ne comporte aucun risque.

Le port d'un casque de réalité virtuelle peut engendrer dans certains cas des risques de nausée, de vertige, de désorientation ou d'anomalies visuelles. Dans le cadre de cette étude, vous procéderez avec attention à vos propres risques. En cas d'accident, la Fondation Artanim décline toute responsabilité.

Confidentialité

Les informations vous concernant collectées pour cette étude demeureront confidentielles. Toutes les données seront analysées de façon anonyme.

Vos droits

1. Vous avez le droit d'accepter ou de refuser de participer à l'étude.
2. Vous êtes libre de vous retirer à tout moment de l'étude, votre choix sera respecté. De même vous devez savoir que l'investigateur peut vous exclure de l'étude s'il le juge nécessaire.
3. L'investigateur principal de l'étude répondra volontiers à toutes vos questions concernant cette recherche.
4. La confidentialité et l'anonymat de vos données seront analysés sous le contrôle strict de l'investigateur principal de l'étude.
5. Un formulaire de consentement vous sera remis.

Dr. Caecilia Charbonnier
Fondation Artanim
Tél: 022 980 91 92

Promoteur de l'étude : Fondation Artanim
Protocole : « Effet de l'auto-animation sur la présence ».

EXPRESSION DE VOTRE CONSENTEMENT POUR LA PARTICIPATION A L'ETUDE

Je soussigné(e), M /Mme_____ (Nom, Prénom)

Né(e) le _____ (jour / mois / année)

certifie avoir été informé(e) par oral et par écrit sur le déroulement et les objectifs de l'étude, à savoir :

- Avoir pris connaissance et compris les informations en annexe, renseignements à propos desquels j'ai été en mesure de poser toutes les questions que je souhaitais
- Avoir pris connaissance que ma participation à l'étude était volontaire
- Avoir été informé(e) des avantages et des risques éventuels pouvant être associés à cette étude
- Avoir disposé(e) d'un temps de réflexion suffisant
- Avoir été informé(e) que je pouvais interrompre à tout instant ma participation à cette étude sans préjudice d'aucune sorte et sans devoir me justifier
- Avoir été informé(e) qu'il n'y aura aucun frais à ma charge
- Avoir été informé(e) que les données recueillies pourront faire l'objet de publications scientifiques et de présentations à des congrès. La confidentialité et l'anonymat de mes données restent garanties

L'information que j'ai reçue est claire et je l'accepte. Je consens par conséquent à participer à cette étude sous les conditions énumérées ci-dessus.

Date (JJ/MM/AAAA) et signature de la personne participant à l'étude :

Date (JJ/MM/AAAA) et signature de l'investigateur:

COPIE POUR LE / LA PARTICIPANT(E)

Promoteur de l'étude : Fondation Artanim
Protocole : « Effet de l'auto-animation sur la présence ».

EXPRESSION DE VOTRE CONSENTEMENT POUR LA PARTICIPATION A L'ETUDE

Je soussigné(e), M /Mme_____ (Nom, Prénom)

Né(e) le _____ (jour / mois / année)

certifie avoir été informé(e) par oral et par écrit sur le déroulement et les objectifs de l'étude, à savoir :

- Avoir pris connaissance et compris les informations en annexe, renseignements à propos desquels j'ai été en mesure de poser toutes les questions que je souhaitais
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L'information que j'ai reçue est claire et je l'accepte. Je consens par conséquent à participer à cette étude sous les conditions énumérées ci-dessus.

Date (JJ/MM/AAAA) et signature de la personne participant à l'étude :

Date (JJ/MM/AAAA) et signature de l'investigateur:

COPIE POUR L'INVESTIGATEUR

FORMULAIRE D'INFORMATION

Promoteur de l'étude : Fondation Artanim
Protocole : « Effet de l'animation sur la présence ».

Madame, Monsieur,

Nous vous proposons de participer à une étude qui a pour but d'évaluer l'impact de différents niveaux de fidélité d'animation du corps sur le sentiment d'immersion dans un environnement virtuel.

Buts de l'étude

Le but de l'étude est d'évaluer dans quelle mesure différents niveaux de fidélité d'animation du corps et du visage (yeux, regard, bouche) ont un impact sur le sentiment d'immersion dans un environnement virtuel.

Description et déroulement de la participation

Votre participation à cette recherche consiste à participer à une session de réalité virtuelle, d'une durée d'environ 30 minutes. Vous serez équipés d'un casque de réalité virtuelle qui vous permet de vous immerger dans un environnement virtuel. Dans cet environnement, vous aurez à visualiser une animation 3D et à répondre à des questions.

A la fin de cette session, vous serez finalement amenés à remplir des questionnaires sur la présence (sentiment d'immersion) et la personnification.

Pour cette étude, les données récoltées seront analysées et traitées par ordinateur ce qui ne requiert pas votre présence.

Bénéfices associés à l'étude

Cette étude n'engendra aucun frais à votre charge. L'analyse de vos données récoltées nous aidera à :

- Identifier les techniques d'animation permettant d'améliorer le degré d'immersion d'un utilisateur dans un environnement virtuel.
- Obtenir des données quantitatives sur l'immersion et la personnification dans des environnements virtuels.

Ces résultats pourraient faire l'objet de publications scientifiques et de présentations à des congrès. Ces publications et ces présentations respecteront rigoureusement la confidentialité et l'anonymat des données.

Risques potentiels

Le port d'un casque de réalité virtuelle peut engendrer dans certains cas des risques de nausée, de vertige, de désorientation ou d'anomalies visuelles. Dans le cadre de cette étude, vous procéderez avec attention à vos propres risques. En cas d'accident, la Fondation Artanim décline toute responsabilité.

Confidentialité

Les informations vous concernant collectées pour cette étude demeureront confidentielles. Toutes les données seront analysées de façon anonyme.

Vos droits

1. Vous avez le droit d'accepter ou de refuser de participer à l'étude.
2. Vous êtes libre de vous retirer à tout moment de l'étude, votre choix sera respecté. De même vous devez savoir que l'investigateur peut vous exclure de l'étude s'il le juge nécessaire.
3. L'investigateur principal de l'étude répondra volontiers à toutes vos questions concernant cette recherche.
4. La confidentialité et l'anonymat de vos données seront analysés sous le contrôle strict de l'investigateur principal de l'étude.
5. Un formulaire de consentement vous sera remis.

Dr. Caecilia Charbonnier
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EXPRESSION DE VOTRE CONSENTEMENT POUR LA PARTICIPATION A L'ETUDE

Je soussigné(e), M /Mme_____ (Nom, Prénom)

Né(e) le _____ (jour / mois / année)

certifie avoir été informé(e) par oral et par écrit sur le déroulement et les objectifs de l'étude, à savoir :

- Avoir pris connaissance et compris les informations en annexe, renseignements à propos desquels j'ai été en mesure de poser toutes les questions que je souhaitais
- Avoir pris connaissance que ma participation à l'étude était volontaire
- Avoir été informé(e) des avantages et des risques éventuels pouvant être associés à cette étude
- Avoir disposé(e) d'un temps de réflexion suffisant
- Avoir été informé(e) que je pouvais interrompre à tout instant ma participation à cette étude sans préjudice d'aucune sorte et sans devoir me justifier
- Avoir été informé(e) qu'il n'y aura aucun frais à ma charge
- Avoir été informé(e) que les données recueillies pourront faire l'objet de publications scientifiques et de présentations à des congrès. La confidentialité et l'anonymat de mes données restent garanties

L'information que j'ai reçue est claire et je l'accepte. Je consens par conséquent à participer à cette étude sous les conditions énumérées ci-dessus.

Date (JJ/MM/AAAA) et signature de la personne participant à l'étude :

Date (JJ/MM/AAAA) et signature de l'investigateur:

COPIE POUR LE / LA PARTICIPANT(E)

Promoteur de l'étude : Fondation Artanim
Protocole : « Effet de l'animation sur la présence ».

EXPRESSION DE VOTRE CONSENTEMENT POUR LA PARTICIPATION A L'ETUDE

Je soussigné(e), M /Mme_____ (Nom, Prénom)

Né(e) le _____ (jour / mois / année)

certifie avoir été informé(e) par oral et par écrit sur le déroulement et les objectifs de l'étude, à savoir :

- Avoir pris connaissance et compris les informations en annexe, renseignements à propos desquels j'ai été en mesure de poser toutes les questions que je souhaitais
- Avoir pris connaissance que ma participation à l'étude était volontaire
- Avoir été informé(e) des avantages et des risques éventuels pouvant être associés à cette étude
- Avoir disposé(e) d'un temps de réflexion suffisant
- Avoir été informé(e) que je pouvais interrompre à tout instant ma participation à cette étude sans préjudice d'aucune sorte et sans devoir me justifier
- Avoir été informé(e) qu'il n'y aura aucun frais à ma charge
- Avoir été informé(e) que les données recueillies pourront faire l'objet de publications scientifiques et de présentations à des congrès. La confidentialité et l'anonymat de mes données restent garanties

L'information que j'ai reçue est claire et je l'accepte. Je consens par conséquent à participer à cette étude sous les conditions énumérées ci-dessus.

Date (JJ/MM/AAAA) et signature de la personne participant à l'étude :

Date (JJ/MM/AAAA) et signature de l'investigateur:

COPIE POUR L'INVESTIGATEUR

Annex VII. TNO-3 Questionnaire

MMSys 2018 - VRTogether

How would you classify the overall experience? *

	1	2	3	4	5	6	7	8	9	
Very bad	( )	( )	( )	( )	( )	( )	( )	( )	( )	Very good

How would you classify the overall video quality? *

	1	2	3	4	5	6	7	8	9	
Very bad	( )	( )	( )	( )	( )	( )	( )	( )	( )	Very good

How would you classify the overall audio quality? *

	1	2	3	4	5	6	7	8	9	
Very bad	( )	( )	( )	( )	( )	( )	( )	( )	( )	Very good

How would you classify the video quality of the 2D 360-degree room (environment)? *

	1	2	3	4	5	6	7	8	9	
Very bad	( )	( )	( )	( )	( )	( )	( )	( )	( )	Very good

How would you classify the video quality of the other person in 2D (user representation)? *

	1	2	3	4	5	6	7	8	9	
Very bad	( )	( )	( )	( )	( )	( )	( )	( )	( )	Very good

How would you classify the video quality of the 3D room (environment)? *

1 2 3 4 5 6 7 8 9

. . .	( )	( )	( )	( )	( )	( )	( )	( )	( )	Very good

How would you classify the video quality of the other person in 3D (user representation)? *

	1	2	3	4	5	6	7	8	9	
Very bad	( )	( )	( )	( )	( )	( )	( )	( )	( )	Very good

Which experience did you prefer? *

- ( ) 2D
- ( ) 3D
- ( ) neither
- ( ) not sure
- ( ) I did not see a difference between both conditions

Age

Gender

- ( ) Female
- ( ) Male
- ( ) Not relevant

Do you have problems with 3D vision?

- ( ) Yes
- ( ) No
- ( ) I don't know
- ( ) Other:

Nationality

Other Comments

Annex V. CWI-2 Questionnaires and Forms

Experiment Consent Form

Welcome to the experiment conducted by the *Distributed and Interactive Systems (DIS)* research group of CWI.

We thank you for participating in our research experiment and give you a short overview of the procedure: You will be sharing photos with your partner in three different situations and will fill out a questionnaire after each situation. After that, a short interview will be performed. The whole process will take around 1 hour.

GATHERED DATA

All data is only used for research purpose. All the data is anonymous, and will not be corresponding to your personal information. Your information will not be given to people who are not related to the experiment.

You may experience motion sickness while wearing the virtual reality headset. You have the right of refusing to participate the experiment, or withdraw from any part of the experiment.

□ I read the consent form and I am voluntary to participate the experiment.

Name: _____

Date: _____

Signature: _____

Background information

This form is about your basic information related to this experiment. All the information will only be used for research purposes.

Age: _____
Email: _____
Gender: Male / Female
Nationality: _____
Profession / major: _____
Dominant hand: Left handed / Right handed / Ambidextrous

Please select your response for the questions below.

1. How proficient are you in using computers?

A.Novice B. Intermediate C. Advanced

2. What's your experience with virtual reality systems?

A. I have never used them before
B. I have some experiences (please answer the next question)
C. I am very experienced (please answer the next question)

- Which of the following virtual reality products have you used?

A. HTC vive B. Oculus rift C. Sony PlayStation D. Samsung Gear E. Others

3. What's the relationship between you and your partner?

A. Friends B. Families C. Colleagues D. Others_____

4. How long have you been knowing each other?

A. < 1 year B. 1~3 years C. 4~5 years D. More than 5 years

5. What's main method of contact between you two? (multiple choice)

A. Face-to-face B. Social media (such as Facebook) C. Skype
D. Phone call E. Email
F. Other_____

6. Which of the following activities did you do in order to maintain the relationship between you two? (multiple choice)

A. Talk to each other B. Share photos or videos C. Play computer games
D. Have a drink E. Cooperation tools (such as Slack)
F. Other_____

7. Do you have any visual or hearing impairment?

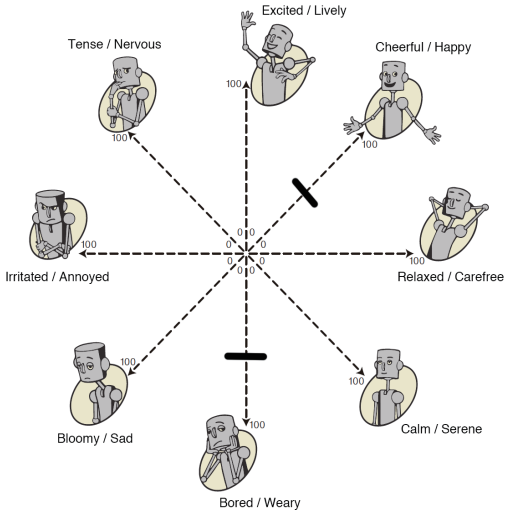
A. No B. Yes, I have problem with _____

Questionnaire for Face-to-face situation

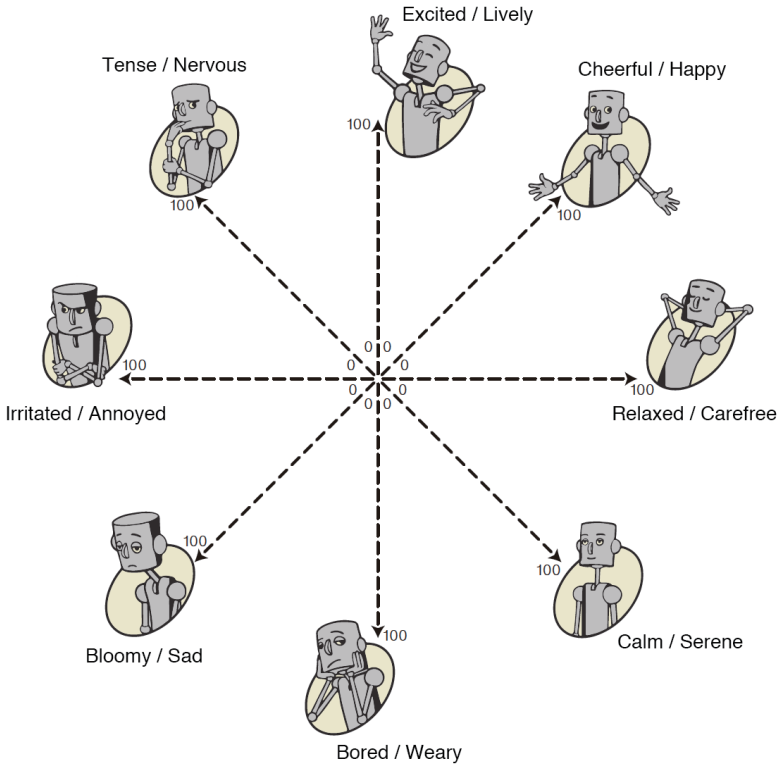
Please answer the questions, according to your experience about face-to-face photo sharing.

1. Please indicate, on the chart below, your own emotion and the emotion of your partner during the face-to-face photo sharing. Please also indicate the emotion intensity (0-100). You only need to report the emotion you have experienced.

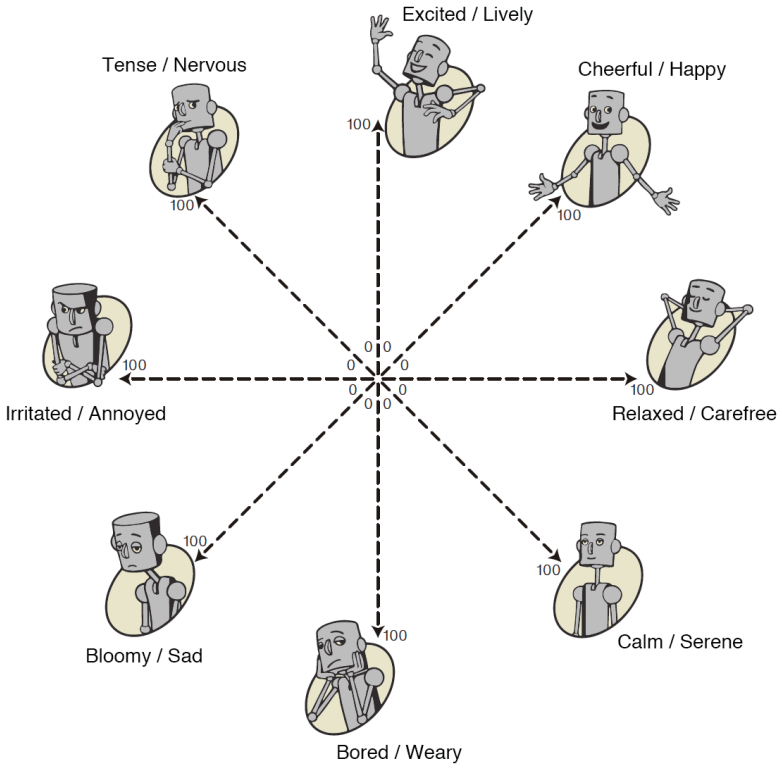
For example



My emotion



My partner's emotion



The scale of the following questions are from 1 to 5, representing the following meanings:
1 Strongly disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly agree

Strongly disagree 1 2 3 4 5 Strongly agree	**1**	**2**	**3**	**4**	**5**
2. "I was able to feel my partner's emotion during the photo sharing."	☐	☐	☐	☐	☐
3. "I was sure that my partner often felt my emotion."	☐	☐	☐	☐	☐
4. "It was easy for me to contribute to the conversation."	☐	☐	☐	☐	☐
5. "The conversation seemed highly interactive."	☐	☐	☐	☐	☐
6. "I could readily tell when my partner was listening to me."	☐	☐	☐	☐	☐
7. "I found it difficult to keep track of the conversation."	☐	☐	☐	☐	☐
8. "I felt completely absorbed in the conversation."	☐	☐	☐	☐	☐
9. "I could fully understand what my partner was talking about."	☐	☐	☐	☐	☐
10. "I was sure that my partner understood what I was talking about."	☐	☐	☐	☐	☐
11. "The experience of photo sharing seemed natural."	☐	☐	☐	☐	☐
12. "The actions used to interact with my partner were natural."	☐	☐	☐	☐	☐

Strongly disagree 1 2 3 4 5 Strongly agree	**1**	**2**	**3**	**4**	**5**
13. "I often felt as if I was all alone during the photo sharing."	☐	☐	☐	☐	☐
14. "I think my partner often felt alone during the photo sharing."	☐	☐	☐	☐	☐
15. "I often felt my partner and I were sitting together."	☐	☐	☐	☐	☐
16. "I paid close attention to my partner."	☐	☐	☐	☐	☐
17. "My partner was easily distracted when other things were going on around us."	☐	☐	☐	☐	☐
18. "I felt that the face-to-face photo sharing experience enhanced our closeness."	☐	☐	☐	☐	☐
19. "Through the photo sharing, I managed to share my memories with my partner."	☐	☐	☐	☐	☐
20. "I derived little satisfaction from photo sharing with my partner."	☐	☐	☐	☐	☐
21. "The photo sharing experience with my partner felt superficial."	☐	☐	☐	☐	☐
22. "I really enjoyed the time spent with my partner."	☐	☐	☐	☐	☐

See graph below	1	2	3	4	5	6	7
23. How emotionally close to your partner do you feel now?	☐	☐	☐	☐	☐	☐	☐

1 2 3 4 5 6 7

Strongly disagree 1 2 3 4 5 Strongly agree	1	2	3	4	5
24.“I did not notice what was happening around me during the photo sharing. ”	☐	☐	☐	☐	☐
25. “I felt detached from the world around me during the photo sharing. ”	☐	☐	☐	☐	☐
26. “At the time, I was focusing totally on photo sharing.”	☐	☐	☐	☐	☐
27. “Everyday thoughts and concerns were still very much on my mind.”	☐	☐	☐	☐	☐
28. “It felt like the photo sharing took shorter time than it really was.”	☐	☐	☐	☐	☐
29. “When sharing the photos time appeared to go by very slowly.”	☐	☐	☐	☐	☐

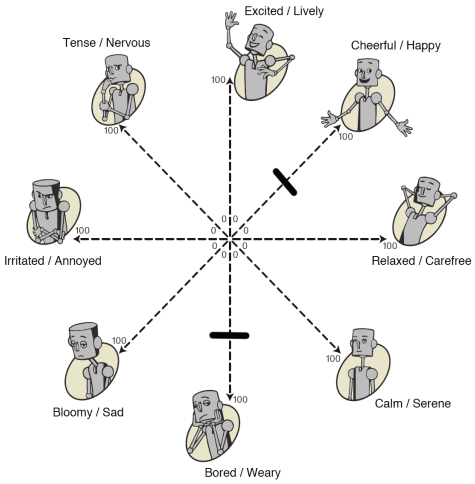
Thank you for your feedback!

Questionnaire for Skype

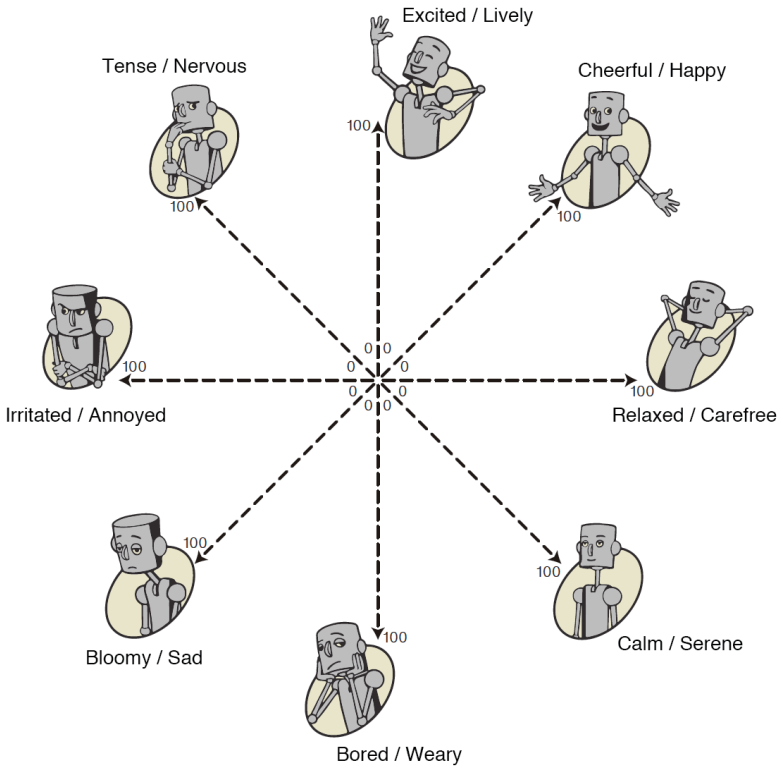
Please answer the questions, according to your experience about photo sharing with Skype.

1. Please indicate, on the chart below, your own emotion and the emotion of your partner during the Skype photo sharing. Please also indicate the emotion intensity(0-100). You only need to report the emotion you have experienced.

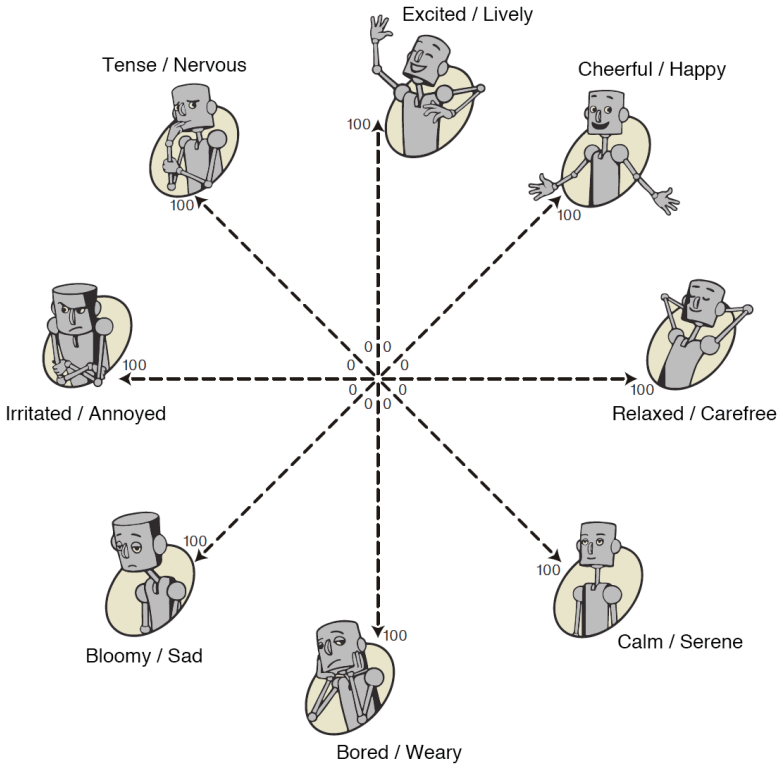
For example



My emotion



My partner's emotion



The scale of the following questions are from 1 to 5, representing the following meanings:
1 Strongly disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly agree

Strongly disagree 1 2 3 4 5 Strongly agree	**1**	**2**	**3**	**4**	**5**
2. "I was able to feel my partner's emotion during the Skype photo sharing."	☐	☐	☐	☐	☐
3. "I was sure that my partner often felt my emotion."	☐	☐	☐	☐	☐
4. "It was easy for me to contribute to the conversation."	☐	☐	☐	☐	☐
5. "The conversation seemed highly interactive."	☐	☐	☐	☐	☐
6. "I could readily tell when my partner was listening to me."	☐	☐	☐	☐	☐
7. "I found it difficult to keep track of the conversation."	☐	☐	☐	☐	☐
8. "I felt completely absorbed in the conversation."	☐	☐	☐	☐	☐
9. "I could fully understand what my partner was talking about."	☐	☐	☐	☐	☐
10. "I was sure that my partner understood what I was talking about."	☐	☐	☐	☐	☐
11. "The experience of photo sharing seemed natural."	☐	☐	☐	☐	☐
12. "The actions used to interact with my partner were similar to the ones in face-to-face situation."	☐	☐	☐	☐	☐

Strongly disagree 1 2 3 4 5 Strongly agree	**1**	**2**	**3**	**4**	**5**
13. "I often felt as if I was all alone during the Skype photo sharing."	☐	☐	☐	☐	☐
14. "I think my partner often felt alone during the Skype photo sharing."	☐	☐	☐	☐	☐
15. "I often felt that my partner and I were sitting togehter in the same space."	☐	☐	☐	☐	☐
16. "I paid close attention to my partner."	☐	☐	☐	☐	☐
17. "My partner was easily distracted when other things were going on around us."	☐	☐	☐	☐	☐
18. "I felt that the Skype photo sharing enhanced our closeness."	☐	☐	☐	☐	☐
19. "Through the Skype photo sharing, I managed to share my memories with my partner."	☐	☐	☐	☐	☐
20. "I derived little satisfaction from photo sharing with my partner."	☐	☐	☐	☐	☐
21. "The photo sharing experience with my partner felt superficial."	☐	☐	☐	☐	☐
22. "I really enjoyed the time spent with my partner."	☐	☐	☐	☐	☐

See graph below	1	2	3	4	5	6	7
23. How emotionally close to your partner do you feel now?	☐	☐	☐	☐	☐	☐	☐

1 2 3 4 5 6 7

Strongly disagree 1 2 3 4 5 Strongly agree	1	2	3	4	5
24. "Through the Skype, I had a sense of being in the same space with my partner."	☐	☐	☐	☐	☐
25. "Somehow I felt that the same space was surrounding me and my partner."	☐	☐	☐	☐	☐
26. "I had a sense of interacting with my partner in the same space, rather than doing it through a screen."	☐	☐	☐	☐	☐
27. "My Skype photo sharing experience seemed as if it was a face-to-face sharing."	☐	☐	☐	☐	☐
28. "I did not notice what was happening around me during the Skype photo sharing."	☐	☐	☐	☐	☐
29. "I felt detached from the world around me during the Skype photo sharing."	☐	☐	☐	☐	☐
30. "At the time , I was totally focusing on photo sharing."	☐	☐	☐	☐	☐
31. "Everyday thoughts and concerns were still very much on my mind.	☐	☐	☐	☐	☐
32. "It felt like the Skype photo sharing took shorter time than it really was."	☐	☐	☐	☐	☐
33. "When sharing the photos, time appeared to go by very slowly."	☐	☐	☐	☐	☐

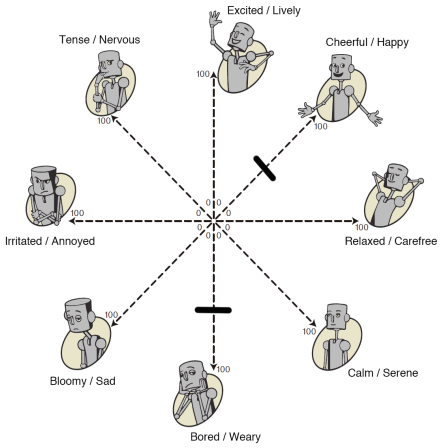
Thank you for your feedback!

Questionnaire for Facebook Space

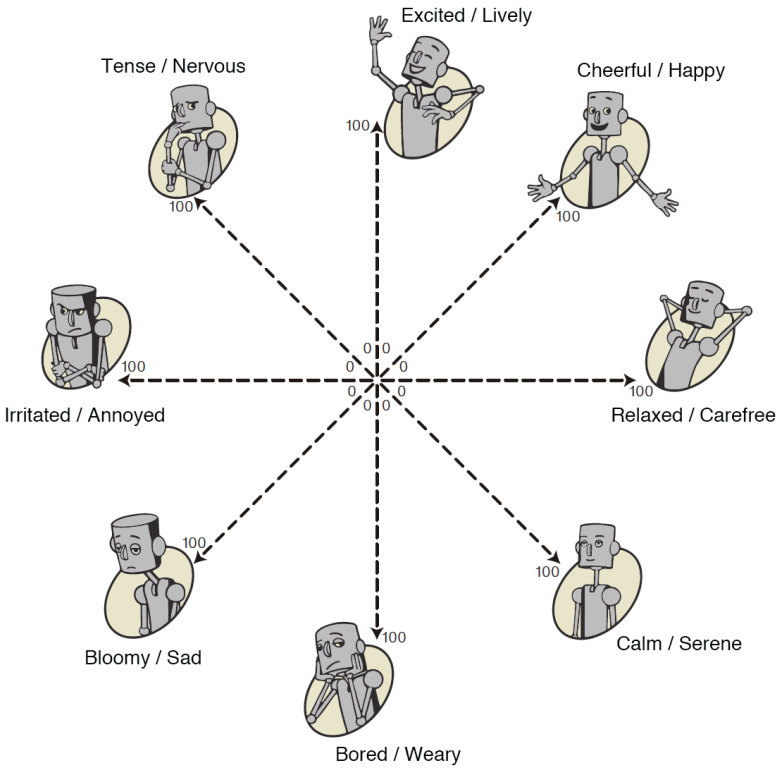
Please answer the questions, according to your experience about photo sharing in social VR.

1. Please indicate, on the chart below, your own emotion and the emotion of your partner during the VR photo sharing. Please also indicate the emotion intensity (0-100). You only need to report the emotion you have experienced.

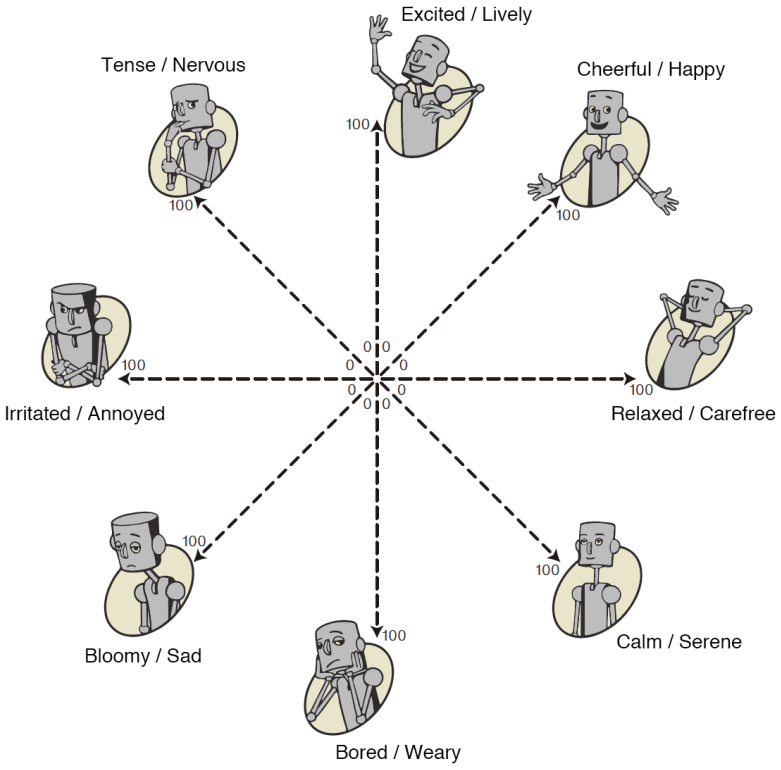
For example



My emotion



My partner's emotion

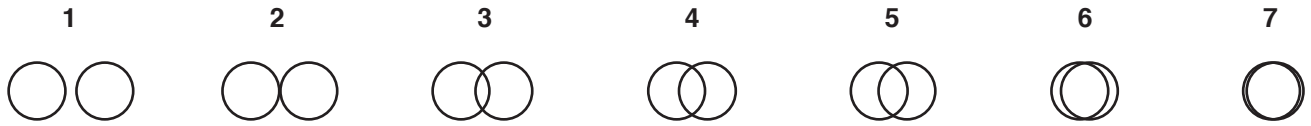


The scale of the following questions are from 1 to 5, representing the following meanings:
1 Strongly disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly agree

Strongly disagree 1 2 3 4 5 Strongly agree	**1**	**2**	**3**	**4**	**5**
2. "I was able to feel my partner's emotion during the VR photo sharing."	☐	☐	☐	☐	☐
3. "I was sure that my partner often felt my emotion."	☐	☐	☐	☐	☐
4. "It was easy for me to contribute to the conversation."	☐	☐	☐	☐	☐
5. "The conversation seemed highly interactive."	☐	☐	☐	☐	☐
6. "I could readily tell when my partner was listening to me."	☐	☐	☐	☐	☐
7. "I found it difficult to keep track of the conversation."	☐	☐	☐	☐	☐
8. "I felt completely absorbed in the conversation."	☐	☐	☐	☐	☐
9. "I could fully understand what my partner was talking about."	☐	☐	☐	☐	☐
10. "I was sure that my partner understood what I was talking about."	☐	☐	☐	☐	☐
11. "The experience of photo sharing seemed natural."	☐	☐	☐	☐	☐
12. "The actions used to interact with my partner were similar to the ones in the real world."	☐	☐	☐	☐	☐

Strongly disagree 1 2 3 4 5 Strongly agree	**1**	**2**	**3**	**4**	**5**
13. "I often felt as if I was all alone during the VR photo sharing."	☐	☐	☐	☐	☐
14. "I think my partner often felt alone during the VR photo sharing."	☐	☐	☐	☐	☐
15. "I often felt my partner and I were sitting together in the same space."	☐	☐	☐	☐	☐
16. "I paid close attention to my partner."	☐	☐	☐	☐	☐
17. "My partner was easily distracted when other things were going on around us."	☐	☐	☐	☐	☐
18. "I felt that the photo sharing experience in VR enhanced our closeness."	☐	☐	☐	☐	☐
19. "Through the VR photo sharing, I managed to share my memories with my partner."	☐	☐	☐	☐	☐
20. "I derived little satisfaction from photo sharing with my partner."	☐	☐	☐	☐	☐
21. "The photo sharing experience with my partner felt superficial."	☐	☐	☐	☐	☐
22. "I really enjoyed the time spent with my partner."	☐	☐	☐	☐	☐

See graph below	1	2	3	4	5	6	7
23. How emotionally close to your partner do you feel now?	☐	☐	☐	☐	☐	☐	☐



Strongly disagree 1 2 3 4 5 Strongly agree	1	2	3	4	5
24. "In the virtual world, I had a sense of 'being there'."	☐	☐	☐	☐	☐
25. "Somehow I felt that the virtual world was surrounding me and my partner."	☐	☐	☐	☐	☐
26. "I had a sense of acting in the virtual space, rather than operating something from outside."	☐	☐	☐	☐	☐
27. "My VR photo sharing experience seemed as if it was a face-to-face sharing."	☐	☐	☐	☐	☐
28. "I did not notice what was happening around me in the real world. "	☐	☐	☐	☐	☐
29. "I felt detached from the outside world during the VR photo sharing."	☐	☐	☐	☐	☐
30. "At the time, I was focusing totally on the photo sharing."	☐	☐	☐	☐	☐
31. "Everyday thoughts and concerns were still very much on my mind."	☐	☐	☐	☐	☐
32. "It felt like the VR photo sharing took shorter time than it really was."	☐	☐	☐	☐	☐
33. "When sharing the photos time appeared to go by very slowly."	☐	☐	☐	☐	☐

Thank you for your feedback!

Interview questions

1. Compared with face-to-face condition, what do you think is missing in Skype or FB Social VR, in terms of interaction?
    - How well do you sense the emotion of your partner?
    - What do you think of the quality of communication?
    - How do they influence your experience? What problem do they bring?
    - Is there any special interaction you like about Skype or FB Social VR?

2. How do you feel about photo sharing experience?
    - Do you think it help you maintain your relationships?
    - Will you use it for getting along with your friends? Which condition will you use? Why?
    - Apart from photo sharing, what else do you want to do with your partner in Skype or Social VR?

3. Are you satisfied with the virtual environment?
    - Do you feel comfortable inside the virtual world?
    - Do you think you are actually in the virtual world? Do you think it is immersive enough?

4. How do you think the product can be improved in the future?
    - What activities do you want to do in social VR?
    - What types of people do you want to meet? What kind of relationships do you want to develop?
    - What do you think is the next generation of social media?

Annex VI. CWI-3 Questionnaires and Forms

Experiment Consent Form

Welcome to the experiment conducted by the *Distributed and Interactive Systems (DIS)* research group of CWI.

We thank you for participating in our research experiment and give you a short overview of the procedure: You will watch movie trailers with your partner in three different conditions. In two conditions, you are requested to wear an HMD (Head Mounted Display). You need to fill out a questionnaire after each condition. After that, a short interview will be performed. The whole process will take around 1 hour.

GATHERED DATA
All data is only used for research purpose. All the data is anonymous, and will not be corresponding to your personal information. Your information will not be given to people who are not related to the experiment.

You may experience motion sickness while wearing the virtual reality headset. You have the right of refusing to participate the experiment, or withdraw from any part of the experiment.

□ I read the consent form and I am voluntary to participate the experiment.

Name: _____

Date: _____

Signature: _____

Background information

This form is about your basic information related to this experiment. All the information will only be used for research purposes.

Age: _____
Email: _____
Gender: Male / Female
Nationality: _____
Profession (or current studies)**:** _____
Dominant hand: Left handed / Right handed / Ambidextrous

Please select your response for the questions below.

1. How proficient are you in using computers?

A. Novice B. Intermediate C. Advanced

2. What's your experience with virtual reality systems?

A. I have never used them before
B. I have some experiences (please answer the next question)
C. I am very experienced (please answer the next question)

- **Which of the following virtual reality products have you used?**

A. HTC vive B. Oculus rift C. Sony PlayStation D. Samsung Gear E. Others

3. What's the relationship between you and your partner?

A. Friends B. Families C. Colleagues D. Others_____

4. How long have you been knowing each other?

A. < 1 year B. 1~3 years C. 4~5 years D. More than 5 years

5. What's main method of contact between you two? (multiple choice)

A. Face-to-face B. Social media (such as Facebook) C. Skype
D. Phone call E. Email
F. Others_____

6. Which of the following activities did you do in order to maintain the relationship between you two? (multiple choice)

A. Talk to each other B. Go to cinema C. Play computer games
D. Have a drink E. Use cooperation tools (such as Slack, WhatsApp)
F. Watch TV together G. Others_____

7. Do you have any visual or hearing impairment?

A. No B. Yes, I have problem with _____

This questionnaire is composed of 28 statements regarding your feelings in social gatherings. Circle YES if you consider that the statement if true of your feelings most of the time. Circle FALSE if you consider that the statement is rarely true of you. Remember that this information is completely *confidential*

	Please circle	
I feel relaxed even in unfamiliar social situations	**YES**	**NO**
I try to avoid situations which force me to be very sociable	**YES**	**NO**
It's easy for me to relax when I am with strangers	**YES**	**NO**
I have no particular desire to avoid people	**YES**	**NO**
I often find social settings upsetting	**YES**	**NO**
I usually feel calm and comfortable in social situations	**YES**	**NO**
I am usually at ease when talking to someone of the opposite sex	**YES**	**NO**
I try to avoid talking to people unless I know them well	**YES**	**NO**
If the chance comes to meet new people, I often take it	**YES**	**NO**
I often feel nervous or tense in casual get-togethers in which both sexes are present	**YES**	**NO**
I am usually nervous with people unless I know them well	**YES**	**NO**
I usually feel relaxed when I am with a group of people	**YES**	**NO**
I often want to get away from people	**YES**	**NO**
I usually feel uncomfortable when I am in a group of people I don't know	**YES**	**NO**
I usually feel relaxed when I meet someone for the first time	**YES**	**NO**
Being introduced to people makes me tense and nervous	**YES**	**NO**
Even though a room is full of strangers I may enter it anyway	**YES**	**NO**
I would avoid walking up to and joining a large group of people	**YES**	**NO**

ID_____ M / F

SAD E / N

When my superiors want to talk to me, I talk willingly	**YES**	**NO**
I often feel on the edge when I talk to a group of people	**YES**	**NO**
I tend to withdraw from people	**YES**	**NO**
I don't mind talking to people at parties or social gatherings	**YES**	**NO**
I am seldom at ease in a large group of people	**YES**	**NO**

Continues overleaf…

	Please circle	
I often think up excuses in order to avoid social engagements	**YES**	**NO**
I try to avoid formal social occasions	**YES**	**NO**
I usually go to whatever social engagements I have	**YES**	**NO**
I find it easy to relax with other people	**YES**	**NO**

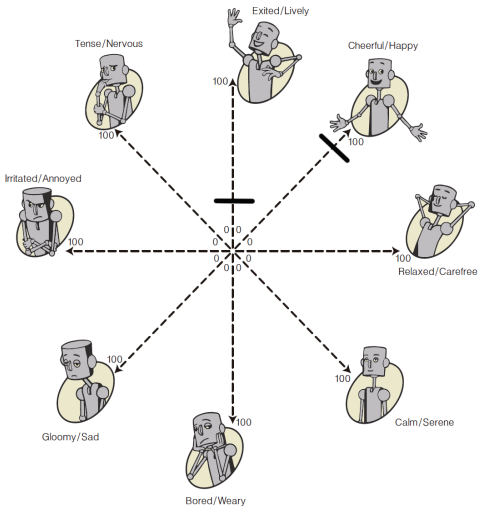
Questionnaire for Real World Situation

Full name:_____, Date:_____, Session_____

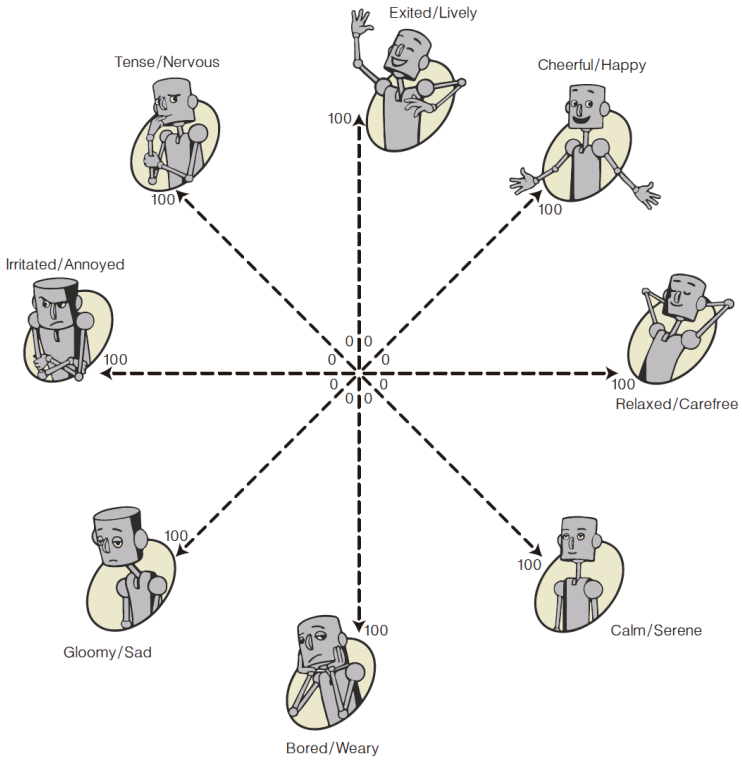
Please answer the questions, according to your movie trailer watching experience with your partner.

1. Please indicate, on the chart below, your own emotion and the emotion of your partner while watching the movie trailer. Please also indicate the emotion intensity (0-100). You only need to report the emotion you have experienced.

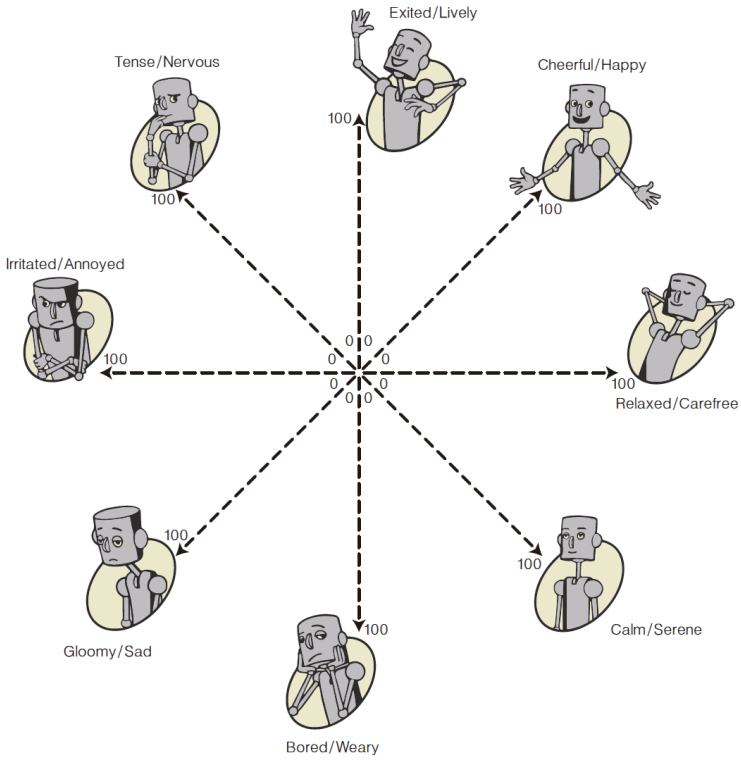
For example



My emotion



My partner's emotion



The scale of the following questions are from 1 to 5, representing the following meanings:
1 Strongly disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly agree

Strongly disagree 1 2 3 4 5 Strongly agree	**1**	**2**	**3**	**4**	**5**
2. "I was able to feel my partner's emotion while watching the trailer."	☐	☐	☐	☐	☐
3. "I was sure that my partner often felt my emotion."	☐	☐	☐	☐	☐
4. "The experience of watching the movie trailer with my partner seemed natural."	☐	☐	☐	☐	☐
5. "The actions used to interact with my partner were natural."	☐	☐	☐	☐	☐
6. "It was easy for me to contribute to the conversation with my partner."	☐	☐	☐	☐	☐
7. "The conversation with my partner seemed highly interactive."	☐	☐	☐	☐	☐
8. "I could readily tell when my partner was listening to me."	☐	☐	☐	☐	☐
9. "I found it difficult to keep track of the conversation."	☐	☐	☐	☐	☐
10. "I felt completely absorbed in the conversation."	☐	☐	☐	☐	☐
11. "I could fully understand what my partner was talking about."	☐	☐	☐	☐	☐
12. "I was sure that my partner understood what I was talking about."	☐	☐	☐	☐	☐
Strongly disagree 1 2 3 4 5 Strongly agree	**1**	**2**	**3**	**4**	**5**
13. "I often felt as if I was all alone while watching the trailer."	☐	☐	☐	☐	☐
14. "I think my partner often felt alone while watching the trailer."	☐	☐	☐	☐	☐
15. "I often felt my partner and I were sitting together."	☐	☐	☐	☐	☐
16. "I paid close attention to my partner."	☐	☐	☐	☐	☐
17. "My partner was easily distracted when other things were going on around us."	☐	☐	☐	☐	☐
18. "I felt that the watching the trailer together enhanced our closeness."	☐	☐	☐	☐	☐
19. "Watching the movie trailer together created a good shared memory between me and my partner."	☐	☐	☐	☐	☐
20. "I derived little satisfaction from the trailer watching experience with my partner."	☐	☐	☐	☐	☐
21. "The trailer watching experience with my partner felt superficial."	☐	☐	☐	☐	☐
22. "I really enjoyed the time spent with my partner."	☐	☐	☐	☐	☐

See graph below	1	2	3	4	5	6	7
23. How emotionally close to your partner do you feel now?	☐	☐	☐	☐	☐	☐	☐

1 2 3 4 5 6 7

Strongly disagree 1 2 3 4 5 Strongly agree	1	2	3	4	5
24.“I did not notice what was happening around me while watching the trailer.”	☐	☐	☐	☐	☐
25. “I felt detached from the world around me while watching the trailer. ”	☐	☐	☐	☐	☐
26. “At the time, watching the movie trailer with my partner was my only concern.”	☐	☐	☐	☐	☐
27. “Everyday thoughts and concerns were still very much on my mind.”	☐	☐	☐	☐	☐
28. “It felt like the trailer watching experience took shorter time than it really was.”	☐	☐	☐	☐	☐
29. “When watching the trailer with my partner, time appeared to go by very slowly.”	☐	☐	☐	☐	☐

Extra questions	Yes	No
30. Have you watched this movie before?	☐	☐
31. Did you like the movie trailer?	☐	☐

Thank you for your feedback!

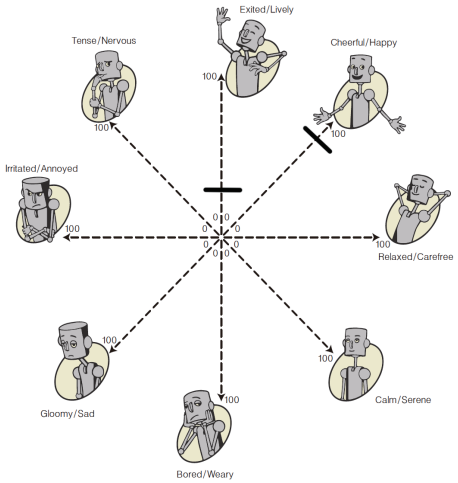
Questionnaire for TNO/Facebook VR System

Full name:_____, Date:_____, Session_____

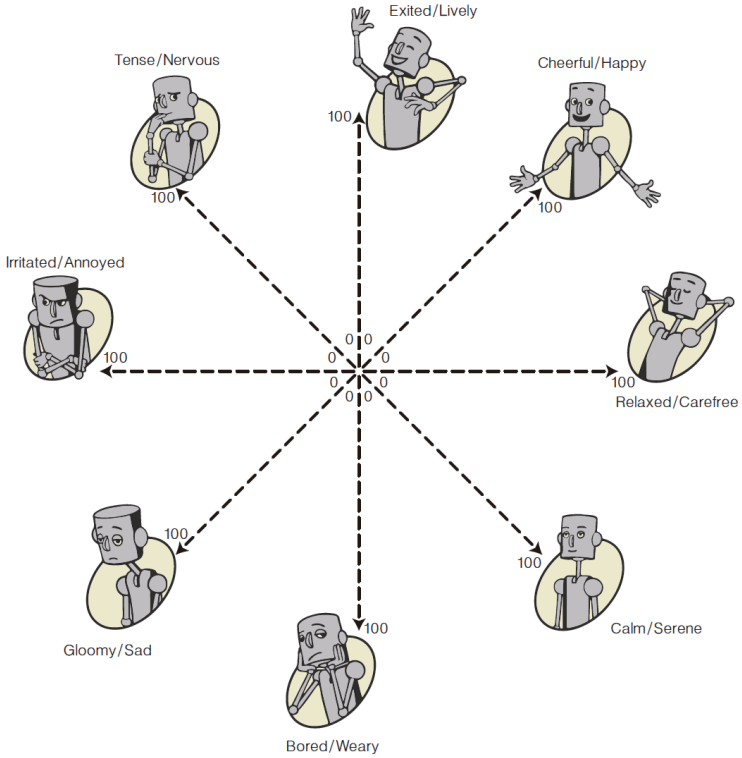
Please answer the questions, according to your experience of watching movie trailers in VR.

1. Please indicate, on the chart below, your own emotion and the emotion of your partner while watching the movie trailer. Please also indicate the emotion intensity. You may report more than one emotion.

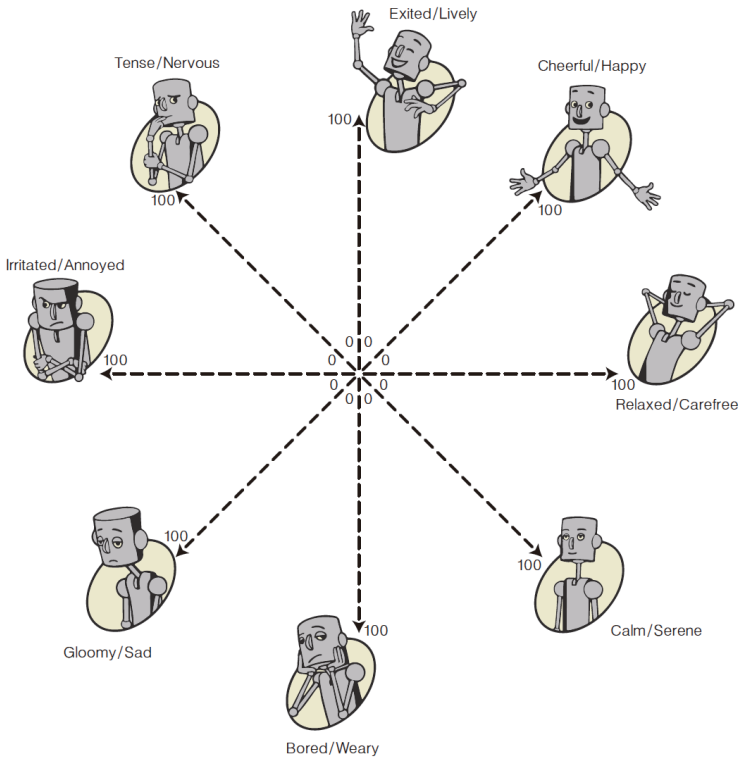
For example



My emotion



My partner's emotion



The scale of the following questions are from 1 to 5, representing the following meanings:
1 Strongly disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly agree

Strongly disagree 1 2 3 4 5 Strongly agree	**1**	**2**	**3**	**4**	**5**
2. "I was able to feel my partner's emotion while watching the trailer."	☐	☐	☐	☐	☐
3. "I was sure that my partner often felt my emotion."	☐	☐	☐	☐	☐
4. "The experience of watching the movie trailer with my partner seemed natural."	☐	☐	☐	☐	☐
5. "The actions used to interact with my partner were similar to the ones in the real world."	☐	☐	☐	☐	☐
6. "It was easy for me to contribute to the conversation with my partner."	☐	☐	☐	☐	☐
7. "The conversation with my partner seemed highly interactive."	☐	☐	☐	☐	☐
8. "I could readily tell when my partner was listening to me."	☐	☐	☐	☐	☐
9. "I found it difficult to keep track of the conversation."	☐	☐	☐	☐	☐
10. "I felt completely absorbed in the conversation."	☐	☐	☐	☐	☐
11. "I could fully understand what my partner was talking about."	☐	☐	☐	☐	☐
12. "I was very sure that my partner understood what I was talking about."	☐	☐	☐	☐	☐

Strongly disagree 1 2 3 4 5 Strongly agree	**1**	**2**	**3**	**4**	**5**
13. "I often felt as if I was all alone while watching the movie trailer."	☐	☐	☐	☐	☐
14. "I think my partner often felt alone while watching the movie trailer."	☐	☐	☐	☐	☐
15. "I often felt that my partner and I were sitting together in the same space."	☐	☐	☐	☐	☐
16. "I paid close attention to my partner."	☐	☐	☐	☐	☐
17. "My partner was easily distracted when other things were going on around us."	☐	☐	☐	☐	☐
18. "I felt that watching the movie trailer together in VR enhanced our closeness."	☐	☐	☐	☐	☐
19. "Watching the movie trailer together created a good shared memory between me and my partner."	☐	☐	☐	☐	☐
20. "I derived little satisfaction from the trailer watching experience with my partner."	☐	☐	☐	☐	☐
21. "The trailer watching experience with my partner felt superficial."	☐	☐	☐	☐	☐
22. "I really enjoyed the time spent with my partner."	☐	☐	☐	☐	☐

See graph below	1	2	3	4	5	6	7
23. How emotionally close to your partner do you feel now?	☐	☐	☐	☐	☐	☐	☐

1 2 3 4 5 6 7

Strongly disagree 1 2 3 4 5 Strongly agree	1	2	3	4	5
24. "In the virtual world I had a sense of 'being there'."	☐	☐	☐	☐	☐
25. "Somehow I felt that the virtual world was surrounding me and my partner."	☐	☐	☐	☐	☐
26. "I had a sense of acting in the virtual space, rather than operating something from outside."	☐	☐	☐	☐	☐
27. "My trailer watching experience in the virtual environment seemed consistent with my real world experience."	☐	☐	☐	☐	☐
28. "I did not notice what was happening around me in the real world."	☐	☐	☐	☐	☐
29. "I felt detached from the outside world while watching the trailer."	☐	☐	☐	☐	☐
30. "At the time, watching the movie trailer with my partner was my only concern."	☐	☐	☐	☐	☐
31. "Everyday thoughts and concerns were still very much on my mind."	☐	☐	☐	☐	☐
32. "It felt like the trailer watching experience took shorter time than it really was."	☐	☐	☐	☐	☐
33. "When watching the trailer with my partner, time appeared to go by very slowly."	☐	☐	☐	☐	☐

Extra questions	Yes	No
34. Have you watched this movie before?	☐	☐
35. Did you like the movie trailer?	☐	☐

Thank you for your feedback!

Interview questions

1. Compared with face-to-face experience, what do you think is missing in the two social VR systems, in terms of interaction?
   - How well did you sense the emotion of your partner?
   - What do you think of the quality of communication?
   - How did it influence your experience? What problem did you notice?
   - Is there any special interaction you like about the two social VR systems?

2. Did you like the movie trailer watching experience?
   - Would you use the social VR systems that you just tried for getting along with your friends? Which VR system would you prefer? Why?
   - Apart from watching TV/movies, what else would you like to do with your friend using social VR systems?
   - Do you think they could help you maintain your relationships?

3. Are you satisfied with the virtual environment?
   - Did you feel comfortable inside the virtual world?
   - Did you feel as if you were in the room when you put your HMD on?

4. How do you think the social VR systems can be improved in the future?
VR system with avatar representation:
_____
VR system with 2D representation of the real person: _____

   - Did anything in the user representation or the virtual environment disturb you? If yes, what and why? (Examples: not seeing the eyes of my partner; not seeing my legs; seeing myself/my partner floating)

5. Extra questions:
   - What activities do you want to do in social VR?
   - What types of people do you want to meet? What kind of relationships do you want to develop?
   - What do you think is the next generation of social media?

Annex VII. TNO-1 Questionnaire

VR Together - Requirements

Demo experience

1. **How would you rate the overall experience?**
   Mark only one oval.

	1	2	3	4	5	
Very bad	◯	◯	◯	◯	◯	Very good

2. **How would you rate the video quality?**
   Mark only one oval.

	1	2	3	4	5	
Very bad	◯	◯	◯	◯	◯	Very good

3. **How would you rate the audio quality?**
   Mark only one oval.

	1	2	3	4	5	
Very bad	◯	◯	◯	◯	◯	Very good

Experience with (social) VR

4. **How often did you experience VR before?**
   Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Not at all	◯	◯	◯	◯	◯	◯	◯	◯	◯	Daily

5. **How interested are you in Social VR experiences?**
   Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Not at all	◯	◯	◯	◯	◯	◯	◯	◯	◯	Very much

6. **What do you like to do in Social VR?**
Check all that apply.

- [ ] Sports
- [ ] Movie
- [ ] Theatre
- [ ] Videogame
- [ ] Education
- [ ] Training
- [ ] Opera
- [ ] Live TV show
- [ ] Videoconferencing
- [ ] Dating
- [ ] Adult entertainment
- [ ] Other: _____

"Intimate" Concert in Social VR?

We now would like to ask you several questions for a specific Social VR case.
Imagine an VR experience that allows you to experience a small concert with your best friend.
How important is it for you...

7. **...to see and hear your friend?**
Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Not important	◯	◯	◯	◯	◯	◯	◯	◯	◯	Very Important

8. **... to interact with your friend?**
Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Not Important	◯	◯	◯	◯	◯	◯	◯	◯	◯	Very Important

9. **... to see and hear the band/singer?**
Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Not important	◯	◯	◯	◯	◯	◯	◯	◯	◯	Very Important

10. **... to interact with the band/singer?**
Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Not Important	◯	◯	◯	◯	◯	◯	◯	◯	◯	Very Important

11. **... being able to walk around in the location?**
Mark only one oval.

	1	2	3	4	5	6	7	8	9	
Not important	◯	◯	◯	◯	◯	◯	◯	◯	◯	Very Important

Other comments

12. **Do you have any other comments or suggestions regarding Social VR?**

_____

_____

_____

_____

_____

Follow up

We will be creating several VR experiences that we'd be happy to inform you about. Also we would appreciate your help. If interested please leave your email address below and select what you would be interested in.

13. **Would you like to help us?**
Check all that apply.

- [ ] I'd like to receive updates about the project
- [ ] I'd like to participate in user studies
- [ ] I'd like to give my expert input / feedback
- [ ] Other: _____

14. **Email**

_____

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Google Forms

Annex VIII. TNO-2 Questionnaire

TNO-2 Questionnaire

Feedback on the 4-person VR experiment.

There are some questions on usefullness and funtionality, some on quality, and some on personal details. Please answer all questions as best you can, or skip if you really cannot or want to answer one.

Questions:

1. The VR system as tested today is suitable for having regular stand-ups.

    Strongly disagree, disagree, neither agree nor disagree, agree, strongly agree

2. The concept of doing stand-ups in VR is a promising concept that should be further pursued.

    Strongly disagree, disagree, neither agree nor disagree, agree, strongly agree

3. What is the amount of people that need to be supported per session, for the system to be usefull in practice?

    2-4, up to 5, up to 6, up to 8, up to 10, 10 or more

4. Please indicate per function how imporant you think it is for having stand-ups in VR.

First option: Shared powerpoint viewing
    Very important, important, moderately important, of little importance, unimportant

Second option: Shared whiteboard editing
    Very important, important, moderately important, of little importance, unimportant

Third option: Personal note-taking
    Very important, important, moderately important, of little importance, unimportant

4th option: Shared document editing
    Very important, important, moderately important, of little importance, unimportant

5th option: personal device usage (i.e. personal phone screen visible in VR)
    Very important, important, moderately important, of little importance, unimportant

6th option: HMD removal (i.e. use computer vision technology to remove the HMD visually from the face)
    Very important, important, moderately important, of little importance, unimportant

Final option: Self view (i.e. see your arms/hands/body in VR)

Very important, important, moderately important, of little importance, unimportant

5. What other functionality is important or very important to having these stand-ups in VR?
Free text field.

6. What other functionality would be nice-to-have for having these stand-ups in VR?
Free text field.

7. Now follow some questions on quality aspects. How would you classify the overall experience?
Bad, poor, fair, good, excellent

8. How would you classify the overall video quality?
Bad, poor, fair, good, excellent

9. How would you classify the overall audio quality?
Bad, poor, fair, good, excellent

10. I really felt immersed in the experience, it felt as if I was actually in the room shown in VR.
Strongly disagree, disagree, neither agree nor disagree, agree, strongly agree

11. I felt connected to the other(s) in the virtual environment.
Strongly disagree, disagree, neither agree nor disagree, agree, strongly agree

12. The other(s) paid close attention to me.
Strongly disagree, disagree, neither agree nor disagree, agree, strongly agree

13. I paid close attention to the other(s).
Strongly disagree, disagree, neither agree nor disagree, agree, strongly agree

14. Physically, the stand-up in VR was a pleasant and relaxed experience.
Strongly disagree, disagree, neither agree nor disagree, agree, strongly agree

15. If you did experience discomfort, when did this start?
From the start, within 5 mins, after about 10 mins, after about 20 mins, near the end

16. If you had any discomfort, can you describe it in a few key words?
Free text field.

17. Finally, some personal details.
Female, male, prefer not to say, other

18. Age group
1-25, 26-35, 36-45, 46-55, 56-65, 66-99

19. Familiarity with VR
First timer, tried it before, some experience, regular experience, VR veteran

20. Do you wear glasses, and if so, did you keep them on during the test?

Not wearing glasses, wearing glasses normally/took them of during the test, wearing glasses while doing the test

21. Anythings else you would like to mention?
    Free text field.

Annex X. End-Users Pilot 1 Questionnaires and Forms

VR-Together Experiment - Background information

This form is used to gather background information about participants for the experiment. The data will be anonymized and only be used for research purposes.

Participants' Name:_____
Gender: Male / Female **Age:** _____
Email: _____
Nationality: _____
Profession (or current studies)**:** _____
Dominant hand: Left handed / Right handed / Ambidextrous

Please select your response to the questions below.

1. How proficient are you in using computers?
A. Novice B. Intermediate C. Advanced

2. What's your experience with Virtual Reality (VR) systems?
A. I have never used them before
B. I have some experience (please, answer the next question)
C. I am very experienced (please, answer the next question)

In case of experience, which of the following VR products have you used?
A. HTC vive B. Oculus rift C. Sony PlayStation D. Samsung Gear E. Others

3. What's the relationship between you and your partner?
A. Friends B. Families C. Colleagues D. Others _____

4. How long have you been knowing each other?
A. < 1 year B. 1~3 years C. 4~5 years D. More than 5 years

5. What's the main contact method between you two? (multiple choice answer)
A. Face-to-face B. Social media (such as Facebook) C. Skype
D. Phone call E. Email
F. Others _____

6. Which of the following activities do you do in order to maintain the relationship between you two? (multiple choice answer)
A. Talk to each other B. Go to cinema C. Play computer games
D. Have a drink E. Use cooperation tools (such as Slack, WhatsApp)
F. Watch TV together G. Others _____

7. Do you have any visual or hearing impairment?
A. No B. Yes, my impairment consists of _____

VR-Together Experiment - Consent Form

Welcome to the experiment conducted by the VR-Together project (http://vrtogether.eu/) and coordinated by [place here the partner's name] researchers. First of all, we thank you for your participation!

Description of the experiment

This experiment is part of a research project on Virtual Reality (VR) and futuristic immersive media experiences. In particular, the experiment is focused on a Social VR scenario in which two participants will be captured and immersed in a common virtual environment to share a media experience about a police investigation theme, while being able to see/hear each other.

The goal of the experiment is to gain insights about key technological and user experience related aspects while using the platform and consuming the contents created in the project.

In the experiment, you will be requested to wear a Head Mounted Display (HMD) and headsets. You may experience motion sickness while wearing the HMD.

Questionnaires and Interviews

After the VR experience, you need to fill in a questionnaire and participate in a brief interview. The whole process will take around 1 hour.

Gathered data

During the VR experience, the participants' gestures and activity will be recorded by using video cameras, sensors and microphones to allow the researchers analysing their behaviour and feelings a posteriori. Some pictures of the experiment could also be taken.

All gathered data (questionnaires, interviews, recordings and pictures) will be anonymized and treated confidentially, will only be used for research purposes within the project, and will not be shared to people not related to the experiment.

Rights

Your participation in the experiment is voluntary, and you have the right of refusing the participation or withdraw from any part of the experiment.

Permission

I,_____ , agree with the content of this document and agree to participate in this study. Likewise, I ***agree / do not agree*** with the usage of pictures/videos from my participation in the experiment in scientific talks and publications.

Date: _____ Signature: _____

Researcher in charge of the experiment: _____

Societal Anxiety Questionnaire

This questionnaire is composed of 28 statements regarding your feelings in social gatherings. Circle YES if you consider that the statement is true of your feelings most of the time. Circle FALSE if you consider that the statement is rarely true of you. Remember that this information is completely *confidential*

	Please circle	
I feel relaxed even in unfamiliar social situations	**YES**	**NO**
I try to avoid situations which force me to be very sociable	**YES**	**NO**
It's easy for me to relax when I am with strangers	**YES**	**NO**
I have no particular desire to avoid people	**YES**	**NO**
I often find social settings upsetting	**YES**	**NO**
I usually feel calm and comfortable in social situations	**YES**	**NO**
I am usually at ease when talking to someone of the opposite sex	**YES**	**NO**
I try to avoid talking to people unless I know them well	**YES**	**NO**
If the chance comes to meet new people, I often take it	**YES**	**NO**
I often feel nervous or tense in casual get-togethers in which both sexes are present	**YES**	**NO**
I am usually nervous with people unless I know them well	**YES**	**NO**
I usually feel relaxed when I am with a group of people	**YES**	**NO**
I often want to get away from people	**YES**	**NO**
I usually feel uncomfortable when I am in a group of people I don't know	**YES**	**NO**
I usually feel relaxed when I meet someone for the first time	**YES**	**NO**
Being introduced to people makes me tense and nervous	**YES**	**NO**
Even though a room is full of strangers I may enter it anyway	**YES**	**NO**
I would avoid walking up to and joining a large group of people	**YES**	**NO**

Participant ID_____ Genre: M / F Session ID_____

When my superiors want to talk to me, I talk willingly	**YES**	**NO**
I often feel on the edge when I talk to a group of people	**YES**	**NO**
I tend to withdraw from people	**YES**	**NO**
I don't mind talking to people at parties or social gatherings	**YES**	**NO**
I am seldom at ease in a large group of people	**YES**	**NO**

	Please circle	
I often think up excuses in order to avoid social engagements	**YES**	**NO**
I try to avoid formal social occasions	**YES**	**NO**
I usually go to whatever social engagements I have	**YES**	**NO**
I find it easy to relax with other people	**YES**	**NO**

Participant ID_____ Genre: M / F Session ID_____

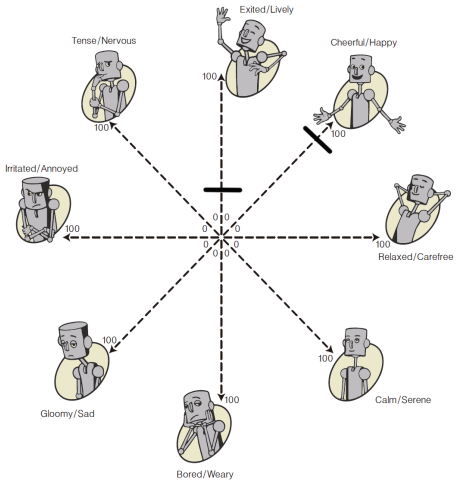
Questionnaire for Pilot 1 - VRTogether Project

Full name:_____, Date:_____, Session Id:_____

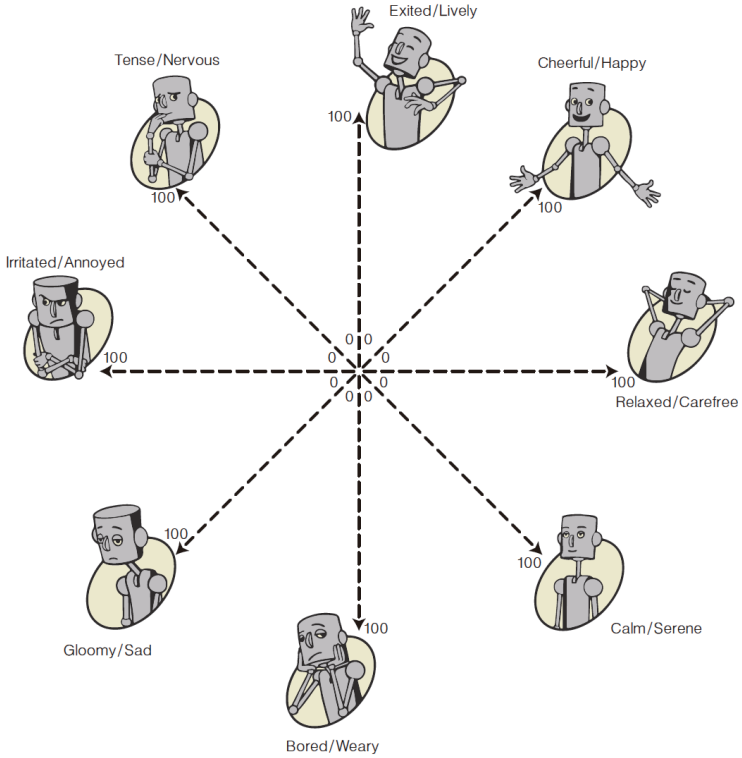
Please answer the questions, according to your experience in the Social VR scenario.

1. Please indicate, on the chart below, your own emotion and the emotion of your partner in the Social VR scenario. Please also indicate the emotion intensity. You may report more than one emotion.

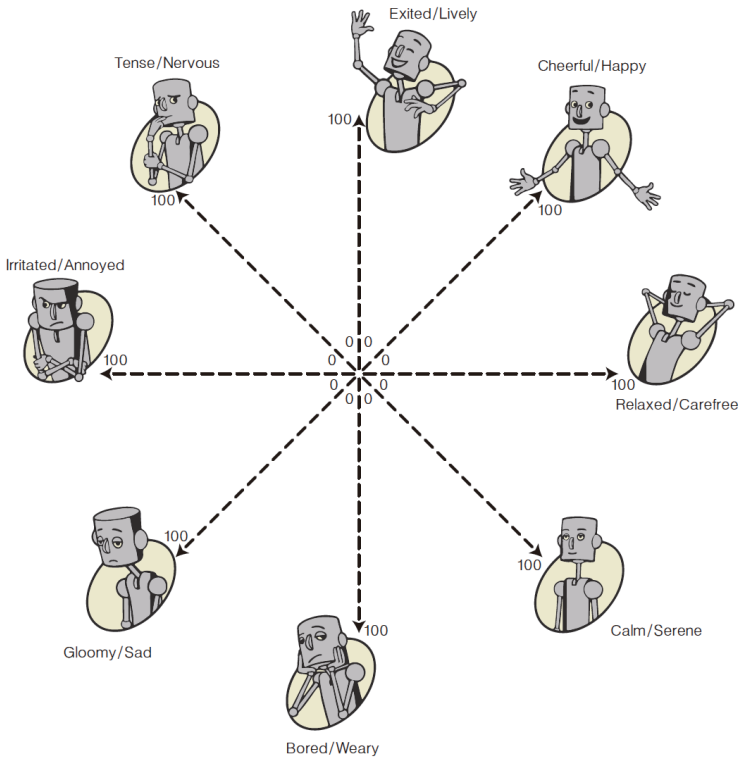
For example



My emotion



My partner's emotion



The scale of the following questions are from 1 to 5, representing the following meanings:
1 Strongly disagree 2 Disagree 3 Neutral 4 Agree 5 Strongly agree

Strongly disagree 1 2 3 4 5 Strongly agree	**1**	**2**	**3**	**4**	**5**
2. "I was able to feel my partner's emotion while watching the contents."	☐	☐	☐	☐	☐
3. "I was sure that my partner often felt my emotion."	☐	☐	☐	☐	☐
4. "The experience of watching the contents with my partner seemed natural."	☐	☐	☐	☐	☐
5. "The actions used to interact with my partner were similar to the ones in the real world."	☐	☐	☐	☐	☐
6. "It was easy for me to contribute to the conversation with my partner."	☐	☐	☐	☐	☐
7. "The conversation with my partner seemed highly interactive."	☐	☐	☐	☐	☐
8. "I could readily tell when my partner was listening to me."	☐	☐	☐	☐	☐
9. "I found it difficult to keep track of the conversation."	☐	☐	☐	☐	☐
10. "I felt completely absorbed in the conversation."	☐	☐	☐	☐	☐
11. "I could fully understand what my partner was talking about."	☐	☐	☐	☐	☐
12. "I was very sure that my partner understood what I was talking about."	☐	☐	☐	☐	☐

Strongly disagree 1 2 3 4 5 Strongly agree	**1**	**2**	**3**	**4**	**5**
13. "I often felt as if I was all alone while watching the contents."	☐	☐	☐	☐	☐
14. "I think my partner often felt alone while watching the contents."	☐	☐	☐	☐	☐
15. "I often felt that my partner and I were sitting together in the same space."	☐	☐	☐	☐	☐
16. "I paid close attention to my partner."	☐	☐	☐	☐	☐
17. "My partner was easily distracted when other things were going on around us."	☐	☐	☐	☐	☐
18. "I felt that watching the contents together in VR enhanced our closeness."	☐	☐	☐	☐	☐
19. "Watching the contents together created a good shared memory between me and my partner."	☐	☐	☐	☐	☐
20. "I derived little satisfaction from the content watching experience with my partner."	☐	☐	☐	☐	☐
21. "The content watching experience with my partner felt superficial."	☐	☐	☐	☐	☐
22. "I really enjoyed the time spent with my partner."	☐	☐	☐	☐	☐

See graph below	1	2	3	4	5	6	7
23. How emotionally close to your partner do you feel now?	☐	☐	☐	☐	☐	☐	☐

1 2 3 4 5 6 7

Strongly disagree 1 2 3 4 5 Strongly agree	1	2	3	4	5
24. "In the virtual world I had a sense of 'being there'."	☐	☐	☐	☐	☐
25. "Somehow I felt that the virtual world was surrounding me and my partner."	☐	☐	☐	☐	☐
26. "I had a sense of acting in the virtual space, rather than operating something from outside."	☐	☐	☐	☐	☐
27. "My content watching experience in the virtual environment seemed consistent with a real world experience."	☐	☐	☐	☐	☐
28. "I did not notice what was happening around me in the real world."	☐	☐	☐	☐	☐
29. "I felt detached from the outside world while watching the contents."	☐	☐	☐	☐	☐
30. "At the time, watching the contents with my partner was my only concern."	☐	☐	☐	☐	☐
31. "Everyday thoughts and concerns were still very much on my mind."	☐	☐	☐	☐	☐
32. "It felt like the content watching experience took shorter time than it really was." [Duration of contents is ~7min]	☐	☐	☐	☐	☐
33. "When watching the contents with my partner, time appeared to go by very slowly."	☐	☐	☐	☐	☐

Extra Questions: Strongly disagree 1 2 3 4 5 Strongly agree	1	2	3	4	5
34. "I liked the created VR contents."	☐	☐	☐	☐	☐
35. "The created VR contents are realistic (i.e. resemble a real scenario)."	☐	☐	☐	☐	☐
36. "The spatiality in the VR scenario (i.e. perceived distances and sizes of elements, including the participants' bodies) is consistent with a real-life scenario."	☐	☐	☐	☐	☐

Thank you for your feedback!

VR-Together Experiment – Interview Questions

1. Compared with a face-to-face experience, what do you think is missing in this Social VR system, in terms of interaction?
   - How well did you sense the emotion of your partner?
   - What do you think of the quality of communication?
   - How did it influence your experience? What problem did you notice?
   - Is there any special interaction you like about the Social VR system?
   - To what degree did you feel identified with your self-representation? And with your partner's representation?

2. Did you like the content watching experience?
   - What do you think of the VR contents you have watched in this experience? Were they immersive? To what extent did they resemble a real scenario? Did they "engage" you?
   - Would you use the Social VR system that you just tried for getting along with your friends?
   - What content genres would you like to consume in these scenarios?
   - Apart from watching TV/movies, what else would you like to do with your friends using Social VR systems?
   - Do you think they could help you maintain and/or strength your relationships?
   - Do you think Social VR systems contribute to overcome distance barriers for sharing experiences with people of interest?

3. Are you satisfied with the virtual environment?
   - Did you feel comfortable inside the virtual world?
   - Did you feel as if you were in the room when you put your HMD on?
   - Did you feel "together" with your partner? If so, do you think this feeling of "togetherness" enriches the user experience?
   - How consistent with the reality did you perceive the spatiality and sizes in the virtual environment? Think about the height and size of your body and your partner's one, distance to the floor, distance to your partner, room size and distribution of virtual elements.

4. How do you think the Social VR system can be improved in the future?
   - Did anything in the user representation or the virtual environment disturb you? If yes, what and why? (Examples: not seeing the eyes of my partner; not seeing my legs; need for further quality, etc.)

5. Extra questions:
   - What activities would you like to do in Social VR?
   - What types of people do you want to meet? What kind of relationships do you want to develop?
   - What do you think is the next generation of immersive Social VR?

Annex XI. Remote Communication Pilot 1
Test Questionnaire

VR-Together Experiment – Remote Scenario Tests

DESCRIPTION / OBJECTIVE

The pilot 1 tests will be mainly conducted in local scenarios, with the equipment for end-users' capturing and communication in different rooms within the same Local Area Network (LAN).

Apart from these tests, remote communication tests for each system configuration will be conducted, also with two participants. In particular, the setups for the tests will consist of:

- Web-based platform: 1 user located at TNO premises (The Netherlands) – 1 user located at i2CAT premises (Spain)
- Native platform with end-users re-constructed with TVMs: 1 user located at CERTH premises (Greece) – 1 user located at i2CAT premises (Spain)
- Native platform with end-users re-constructed with Point Clouds: 1 user located at CWI premises (The Netherlands) – 1 user located at i2CAT premises (Spain)

For each system configuration, 3 researchers from each institution will participate in the remote communication tests in which these institutions are involved in. These researchers must have previously tested the experience in a local scenario. The goals of these tests are:

- To validate the communication between the two remote sites.
- To gather objective performance metrics. This will allow gaining insights about the requirements and limitations of the VR-Together platform to enable shared experiences between remote participants.
- To allow the researchers experiencing in first person the perceived performance and media quality in such scenarios. This will allow better understanding the technological aspects that already perform satisfactorily and the ones that need to be optimized to enable Social VR scenarios for remote users.

After each test, the researchers will fill in the next short questionnaire and will have a short discussion about their opinion / perception about the shared experience.

QUESTIONNAIRE

Participant's Name / Institution:_____

Remote Participant's Name / Institution:_____

Pipeline Tested: __ Web-based Pipeline; __ Native Pipeline + TVM; __ Native Pipeline + PC

Technical Issues

Q1. Did you encounter any technical issues in the remote communication test? Yes __ No __
If yes, please briefly describe the issues and if/how you solved them.

_____

_____

Questions about Audio Quality

Q2. Compared to the Local Scenario Test, the perceived audio quality for the communication between participants is:

___ No differences have been perceived
___ A bit lower, but still acceptable
___ Much lower, and needs to be improved

Q3. In general, the perceived audio quality for the communication between participants is satisfactory:

___ Totally disagree
___ Partially disagree
___ Neither agree nor disagree
___ Partially agree
___ Totally disagree

Questions about Video Quality

Q4. Compared to the Local Scenario Test, the perceived video quality for the remote end-user's reconstruction is:

___ No differences have been perceived
___ A bit lower, but still acceptable
___ Much lower, and needs to be improved

Q5. Compared to the Local Scenario Test, the fluency and naturalness of the movements and gestures of the reconstructed remote end-user are:

___ No differences have been perceived
___ A bit worse, but still acceptable
___ Much worse, and needs to be improved

Q6. The movements and gestures of the reconstructed remote end-user are perceived as fluent and natural:

___ Totally disagree
___ Partially disagree
___ Neither agree nor disagree
___ Partially agree
___ Totally disagree

Q7. In general, the perceived video quality for the remote end-user's reconstruction is satisfactory:

___ Totally disagree
___ Partially disagree
___ Neither agree nor disagree
___ Partially agree
___ Totally agree

Questions about Delays and Synchronization

Q8. Compared to the Local Scenario Test, the perceived delays for the end-to-end audio communication are:

___ Same order
___ A bit higher, but still acceptable
___ Much higher, and need to be reduced

Q9. Compared to the Local Scenario Test, the perceived delays for the end-to-end video communication is:

___ Same order
___ A bit higher, but still acceptable
___ Much higher, and need to be reduced

Q10. The synchronization levels between the end-to-end audio and video interaction channels between users are satisfactory

___ Totally disagree
___ Partially disagree
___ Neither agree nor disagree
___ Partially agree
___ Totally agree

Q11. The synchronization levels between the audiovisual contents from the end-users' capturind/reconstruction and the ones for the shared environment are satisfactory
[For instance, think whether the users' comments and movements were time-aligned with the contents being presented, like users reacting immediately to event, triggers and questions]

___ Totally disagree
___ Partially disagree
___ Neither agree nor disagree
___ Partially agree
___ Totally agree

Q12. Based on the experience, I believe that synchronization between participants will be a key requirement for pilot 2, in which more participants will be involved in the shared Social VR scenario. *[Note that DVB-CSS support has been added just before the pilots]*

___ Totally disagree
___ Partially disagree
___ Neither agree nor disagree
___ Partially agree
___ Totally agree

Experience

Q13. “The audiovisual communication channels between users enable high quality and interactive conversations”.

___ Totally disagree
___ Partially disagree
___ Neither agree nor disagree
___ Partially agree
___ Totally agree

Q14. “I often felt that my partner and I were together in the same space”.

___ Totally disagree
___ Partially disagree
___ Neither agree nor disagree
___ Partially agree
___ Totally agree

Q15. In general terms, the VR-Together platform already enables satisfactory shared and interactive experiences between remote participants.

___ Totally disagree
___ Partially disagree
___ Neither agree nor disagree
___ Partially agree
___ Totally agree

Final Discussion

Please, discuss and indicate your thoughts about the technological aspects that already perform satisfactorily and the ones that need to be optimized to successfully enable Social VR scenarios for remote participants. Pay special attention to performance issues influenced by the existence of bandwidth and delay limitations in the remote scenarios.

Do you suggest any direction/action to optimize the system performance and improve the overall experience for next pilots?

Annex XII. Pilot 1 with Professionals Questionnaire

VRTogether Survey @IBC

H2020 VRTogether project

The VRTogether project focusses on two main concepts: - Delivering high-quality photo-realistic content for immersive experiences. - Creating a strong feeling of co-presence in VR experiences. In short: being there together. The goal of this survey is to help steer our project in the right direction. Please feel free to fill in what you can, and skip what you cannot answer.

When do you expect the consumer use of VR to really take off?

	Now	2020	2022	2025	Beyond 2025	Never
Timing	( )	( )	( )	( )	( )	( )

What are the most important VR applications for consumers:

	Unimportant	Of little importance	Moderately important	Important	Very important
Gaming	( )	( )	( )	( )	( )
Movies & TV shows	( )	( )	( )	( )	( )
News	( )	( )	( )	( )	( )
Sports	( )	( )	( )	( )	( )
Social Networking	( )	( )	( )	( )	( )
Shopping	( )	( )	( )	( )	( )
Dating	( )	( )	( )	( )	( )

Other important applications:

Which types of content do you think are most suitable for VR:

	Not suitable	Somewhat suitable	Moderately suitable	Suitable	Very suitable
Live sports	( )	( )	( )	( )	( )
Live music	( )	( )	( )	( )	( )
Live news	( )	( )	( )	( )	( )
Movies	( )	( )	( )	( )	( )
TV shows	( )	( )	( )	( )	( )
TV series	( )	( )	( )	( )	( )
Travel programs	( )	( )	( )	( )	( )
Animation	( )	( )	( )	( )	( )

Other suitable content:

Which types of content will have the most benefit from experiencing it together, e.g. with a partner, with family, with friends?

	Not beneficial	Somewhat beneficial	Moderately beneficial	Beneficial	Very beneficial	Much benefit
Live sports	( )	( )	( )	( )	( )	( )
Live music	( )	( )	( )	( )	( )	( )
Live news	( )	( )	( )	( )	( )	( )
Movies	( )	( )	( )	( )	( )	( )
TV shows	( )	( )	( )	( )	( )	( )
TV series	( )	( )	( )	( )	( )	( )
Travel programs	( )	( )	( )	( )	( )	( )
Animation	( )	( )	( )	( )	( )	( )

Other content that benefits from experiencing it together:

There are various aspects that are currently in scope of the VRTogether project. Please indicate the importance of these aspects on a shared VR experience:

	Unimportant	Of little importance	Moderately important	Important	Very important
User self-view, i.e. that a user sees his/her self	( )	( )	( )	( )	( )
VR headset removal, i.e. that in the representation you see of other users, the VR headset in the image is replaced with a reconstructed image of the users face and eyes	( )	( )	( )	( )	( )
Interaction capabilities with the scene, e.g. have the ability to move objects	( )	( )	( )	( )	( )
Live content distribution, e.g. for sports events	( )	( )	( )	( )	( )

PC based experiences	( )	( )	( )	( )	( )
Mobile based experiences	( )	( )	( )	( )	( )
More (>2) simultaneous users	( )	( )	( )	( )	( )

Other important aspects for the VRTogether project:

Any other comments you wish to make:
Gender

- ( ) Female
- ( ) Male
- ( ) Prefer not to say

Age group

- ( ) Below 25
- ( ) 26-35
- ( ) 36-45
- ( ) 46-55
- ( ) 56-65
- ( ) 66 or above

E-mail (for receiving survey results only)