

THE MACHINE **TO BE ANOTHER**

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PROTOCOLS
AND
GUIDELINES

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DESCRIPTION

The Machine to Be Another (TMBA) is an embodied VR system designed to create in users the perceptual illusion of seeing themselves through another's perspective. In this setup, a subject sees himself in the body of a performer that copies her movements. The subject has agency and can interact physically with controlled tactile stimulus. In an extended version of this experience the user can listen to a story, or narrative, shared by the performer through segments of pre-recorded audio.

The interactions presented in this guideline are a synthesis of the best practices used in TMBA for the last 3.5 years of development; based on observation, qualitative interviews, academic supervisions, and measurements.

Sections.

The experience is divided in 4 sections presented lineally to the user, so the experience can be constructed layer by layer (every section adds another element). Each of these sections will be presented in more detail in a later section.

- 1. EXPLORATION:** users have agency on the head movements (which control the orientation of the camera) and on the hands and body (copied by the performer).
- 2. TOUCH:** assistants provide the subject with tactile feedback by touching both of their hands at the same time (3 times), and stimulating the right hand and middle finger with the assistants index finger (3 times). Both assistants should replicate this in synchrony.
- 3. OBJECT + NARRATIVE:** Assistants handle an object to the user corresponding to a prerecorded audio with a story shared by the performer.
- 4. FACING EACH OTHER:** The screen is dimmed off and subjects are told to wait for a second. When the subject opens her eyes, she sees herself in front of her (as a third person). She is free to move. When she holds the hand of performer, assistant provides tactile feedback by tapping both the user and the performer. Note: This section of the experiment is tricky to follow as when the subject and performer are facing each other the right hand of the performer most correspond to that of the subject.

Human factor note: Although all the interactions follow procedures to have precise synchrony, there will always be a slight error. For example: the latency or eventual imprecision of the performer copying the subject; the latency or eventual imprecision of assistants; the size difference between hands of the assistants, and that of apparently similar objects. From observations and ongoing experimental data, this imprecision is generally accepted by subjects. To reduce this factor it's important to prioritize moving slowly.

PRIOR PREPARATION

Human requirements.

At least three people should be present to run the experiment: 2 assistants and 1 performer.

Setting up the system

Hardware

1. Put on the vest.
2. Turn on the switch on the vest.
3. Make sure that the camera is centred in the middle of the chest.

Software

1. Turn on the computer and open The Machine to Be Another icon on the Desktop [image 1].
2. Calibrate the image by pressing the n key while the Oculus is centred.
3. Hide the menu by pressing the m key.
4. Turn off the Oculus screen by pressing the m key before putting the Oculus to the subject.
5. Follow the calibration steps described in the PROTOCOL section of this document.

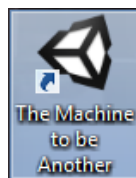


Image 1. The Machine to Be Another desktop icon

Training the performers

Have a couple of trials with the performer following a subject. Test both spatial setups, side by side and front to front positions.

Narrative

Narratives are usually a series of short .5 minutes to 2 minute recordings narrated by a performer. We usually use the following questions for each of the audios of the series:

- i. (Related to identity) share something that you like on you and on moving
- ii. (Related to vulnerability) share some thought about being vulnerable
- iii. (Related to self compassion) share some thought about forgiving yourself

Audios should be in separate tracks, ideally compressed and normalised.

PROTOCOL

Hosting Participant

It's important to start by welcoming subjects and helping them to feel comfortable. This is, help them to seat, remove rings, bracelets and clocks. Explain the principle of the system: "a system that allows you to see yourself under another's perspective. It will take around 20 min. We'll be here to help you if needed. If you don't feel comfortable, just ask for help".

Pay special attention to instructing them to move freely (without standing up), but **very slowly** all the time. It's important to have the biggest similarity possible in terms of clothing to that of the performer (special attention to short or long sleeves).

Running the experiment

Setting up.

Calibrating: Approximately 2 min

- Have the performer wear the oculus and the vest and stretch both arms in front of the head (image 2).
- Press the calibrate button on the computer (n key).
- The image should be centered and consistent to her usual point of view (image 2). Correct the position of the vest's camera until this is the case.



Image 2. Procedure for image calibration. Make sure that the arms of the performer are centred.

Setting up for subject: Approximately 2 min

- Make sure that the image is turned OFF (b key for turning on and off).
- Help the subject to wear and adjust all the gear and make sure she is comfortable. Center her head.
- The performer should position herself in the same position as the subject before starting (image 3).
- Press calibrate (n key).



Image 3. Position of subject (on the right) and performer (left) before initiating.

Running.

1. Exploration - Approximately 2m

- Let the subject interact with the system for 2 minutes.
- Assistants should not be in the field of vision of user.

2. Touch

Touch 1.

- The assistants should come in the field of view of both the performer and the subject. Kneeing in front of them, wave the right hand slowly (Image 4-5). After, offer both hands to be touched by user.
- The touch should be with both hands, palm to palm, making sure that the tip of each finger coincides with the corresponding finger.
- In order to have the touch synchronised, begin counting four times (three, two, one, touch); and touch on the 4th. Pay attention to the rhythm; both assistants should ideally count at the same time listening to each other. The hands should be touching for two seconds. Afterwards, count again 4 times (three, two, one, release) and release on the fourth. Repeat this process three times.
- The assistants should stand up and clear the field of vision of user



Image 4, 5: Touch feedback. Image 4 shows assistants before providing the first touch interaction and image 5 when they touch the subject and performer synchronously.

Touch 2.

- The assistants should come in the field of view of both the performer and the subject.
- With the right hand, assistants grab the left wrist of performer with the thumb and the index fingers.
- Synchronously, and by looking at each other, they should place the palm of the subject's hand in the center of their field of view. The following action will have ten times (three, two, one, touch; slide, slide, slide; three, two, one, release).
- On the 4th time (three, two, one, touch) Touch them with the index finger at the lower center of the hand, where the arm ends and the arms begins.
- The assistant's index finger should slide up through the palm by counting three more times (slide, slide, slide).
- The assistant's index finger should start the first tempo on the subject's middle finger on the 8th time (three, two, one, release), and slide up to the tip to release on the last tempo.
- This process should be repeated 3 times.
- After the repetition, release the subjects right hand by counting 4 tempos (three, two, one, release)
- The assistants should stand up and clear the field of vision of user

Touch 3.

- The assistants should come in the field of view of both the performer and the subject.
- Point at the performers right foot (so that the user see's it). When they start moving their foot, touch with the thumb on the sole of their foot and with the rest of the fingers on the upper part of their foot.
- For synchronizing count 4 times to touch on the forth (three, two, one, touch); stay there for two seconds; and count four more times to release on the forth (three, two, one, release). See figure 6 for reference.



Image 6: Touch feedback. Both assistants touching the subject and the performer's foot synchronously.

3. Object + Narrative (optional)

Objects should be as identical as possible and somehow related to the story being told, e.g. if the story is related to the performer's mother, a photo of the mother could be an appropriate object (see figure 7).

- Assistant plays the first audio track and hands in an object in synchrony by counting four times (four, three, two, give). Ideally put the object on the open hand of the subject.
- Count four times to remove the object.
- Repeat this process for each narrative and corresponding object.



Image 7: Object and corresponding narrative.

4. Face to Face

- Turn off the screen by pressing the **b** key on the computer.
- The performer should move her chair and position it in front of the subject (see image 8). Their knees should be about 20cm apart. See image 7 for reference.
- Turn on the screen by pressing the **b** key on the computer.
- An assistant (ideally the one that was acting in front of the performer throughout the experience) should provide tactile feedback on the hand or on the arm. A suggestion for this is to slide the index finger in the forearm or to touch a fingernail. Use the same method for synchronisation of four times to touch and four to release.

Note that following the movements in this position is complicated for the performer, as the right hand should correspond to the subject's right hand. This is also the case for the assistant.



Image 8: Face to face; subject seeing himself as a third person, from the perspective of the performer.

5. Wrap up.

- Turn off the screen by pressing the **b** key on the computer.
- Thank the subject and remove the headphones; then tell her that you are about to remove the headset and help her with that.