

Nijmegen, 01-03-2024

Technical description regarding renewal "gesture-lab"

The department of Multimodal Language within the Max Planck Institute Nijmegen (MPI) focuses on research into gestures and their functioning within language. For this research, researchers within this department will regularly conduct experiments in which gestures are recorded and analyzed. The MPI has a laboratory, the "gesture lab," where such experiments can be realized. This lab was realized around 2012, but no longer meets the current requirements of the department in question. The Technical Group (TG) has been given the task of renovating this lab, based on requirements and wishes set by the department.

In the current lab, there are 4 cameras in the experiment room, which are synchronized via LTC time code with each other and with a PC in the control room. This PC can capture video and audio from the cameras, in both MPEG2 and MP4 formats, at a rate of up to 50 frames per second. Audio is captured on the cameras via external microphones. The camera positions can be adjusted via pantographs and a track system. Lighting is provided via LED ceiling panels, which can be dimmed and have daylight tints. Blue curtains around the lab are setup to create a neutral background.

These mentioned specifications are now obsolete. What follows are the requirements for the new setup, some of which will be realized by the TG itself. This is designated as such and these components will be present in the room, or will be installed during installation of the new setup in consultation with the contractor.

Experiment space requirements and specifications:

- The laboratory experiment room should be equipped with 6 video cameras all around. See the appendix regarding positioning in the room.
- These cameras must be equipped with PTP synchronization. This will be established via a Gigabit Ethernet connection.
- Cameras must include at least a 1 1/8" CMOS sensor to ensure that high resolutions, frame-rates can be achieved.
- Cameras must support a frame rate of 150 to 200 frames per second at a resolution of 1280x720 pixels.
- The lens on the cameras will be a 4mm C-mount lens with manual control.
- Cameras should support freely adjustable aperture and shutter speed.
- The cameras should have MJPEG compression on-board to encode the incoming images, thus reducing computational load on the recording PC in the control room.

Specifications realized by the TG:

- Cameras are attached to the side wall, via flexible arms with video heads. These arms are supplied and attached by the TG.
- Lighting in the room is present and consists of daylight flicker-free ceiling LEDs
- In addition, front lighting is installed by TG, consisting of LED panels with daylight white (6500k) of 60x60 or 90x90, attached to flexible arms.
- Audio must be captured via high quality external microphones, these microphones will be attached to the cameras if possible. The TG will provide microphones and cabling, installation will be in consultation with the contractor and carried out by TG. Should installation on the cameras not be possible, TG will provide an alternative solution regarding mounting.

Requirements and specifications regarding the control room:

- The recording system must consist of a backend framework that captures and stores/manages the recordings and a GUI/frontend that controls the backend.
- Synchronization of the video and audio should be controlled by software, maintaining PTP synchronization.
- A preview monitor is provided on which the live feed from any of the cameras can be viewed at all times.
- The software should be able to capture high quality video as well as generate a lower "proxy" version of the same recording.
- The system should be able to make recordings of 60-120 minutes without problems, while ensuring synchronization of the 6 cameras and audio.
- The software system must be user-friendly. Users should be able to start and stop a recording with a single button press.
- Users should be able to easily deploy 1 or more cameras within the software to make recordings.
- Captured data should easily be reviewable on the system and easily moved to the user's personal network location.
- Support and updates to the software will be guaranteed by the implementer.

Specifications control room supplied by TG:

- The control room will be equipped with a professional rack and desks for the purpose of recording equipment. The TG will provide these.
- For the purpose of software, 2 workstations will be provided by TG, after consultation with the performer regarding specifications.
- A 10gb switch will be provided by the TG.
- The connection from the PC to the microphones and external audio sources will be made via an external USB audio mixer. This mixer contains 10 to 16 input tracks and will be provided by the TG in consultation with the contractor.

The above specifications will guide the setup of the new laboratory. As indicated, some of the requirements will be provided/realized by the TG. For questions regarding specifications, please contact the client.

Upon approval of the quote *with the MPI order form*, delivery and installation will take place by 31-05-2024.

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Attachments:

- 1. Room layout lab/control room.
- Technical drawing

1. Gesture-lab

