Workshop: Exploring Biosensory Information as Embodied Social Cues for Enhancing Metaverse Copresent Experience

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Workshop Proposal for: ChCHI 2024 Workshop, November 22
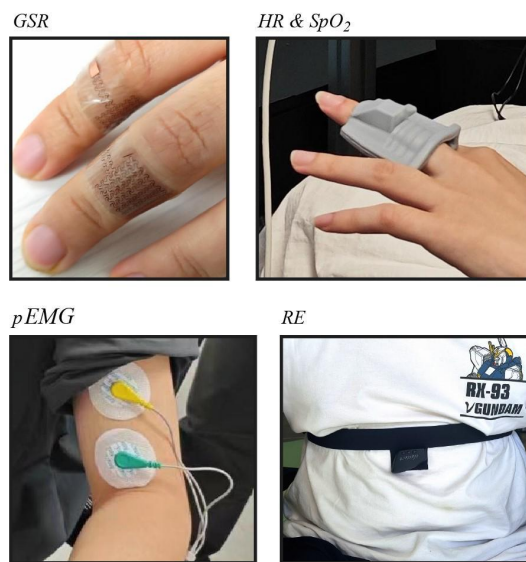
Figure (A). *Biosensors Used*

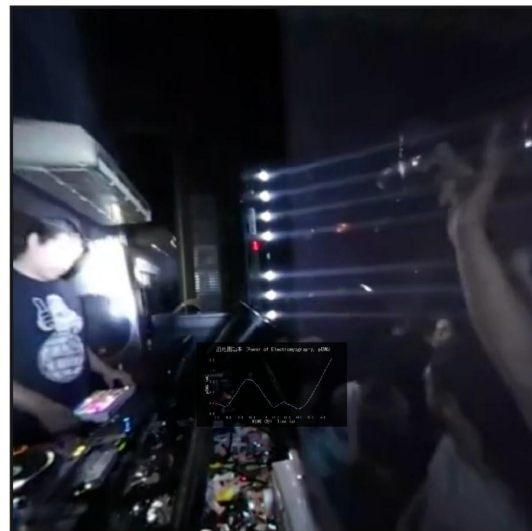**Figure (B).** *EDM Scene with Biosensory Cues in 360° VR Environment*

GSR

HR & SpO₂

pEMG

RE

Figure (A). *Power of Electromyography, pEMG*

肌电图功率 (Power of Electromyography, pEMG)

Figure (B). *Galvanic Skin Response, GSR*

皮肤电反应 (Galvanic Skin Response, GSR)

Figure (C). *Heart Rate, HR*

心率 (Heart rate, HR):
62.0 BPM

Figure (D). *Respiration Effort, RE*

呼吸努力
(Respiration Effort)

Figure (E). *SpO₂*

血氧饱和度
(SpO₂):
95.9%
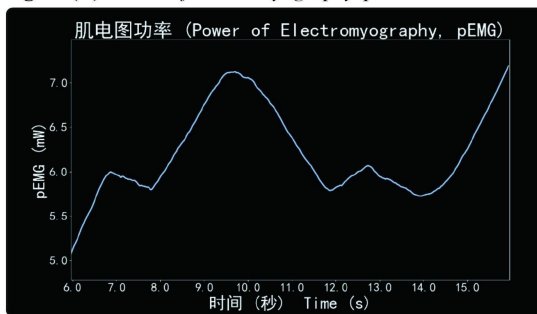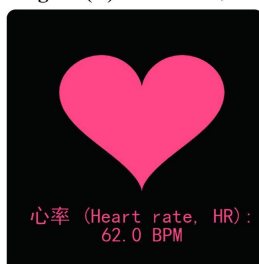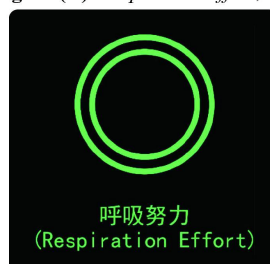
Participants:

Due to limited VR headsets, maximum 3 participants in a row can experience our technical demo. If all equipment are occupied, new participants need to await until any of the previous sessions completes. Each session is estimated to last for 5 minutes.

Equipment needed:

Participants may need to bring laptop or tablet in order to complete an online survey.

Workshop Duration:

9:00 - 12:00 (estimated)

Workshop location:

Nanshan Intelligence Park, Building C1, 10th or 11th floor, Room xxxx

Workshop Description:

This study aims at leveraging people's psychophysiological information as metaverse social embodied cues to enhance large-scale co-occurring experiences. To this end, we intend to explore and reveal people's cognitive preferences for various types of biosensory signals and their corresponding expressions. We will guide each participant to experience a DJ performance in a VR environment that incorporates five biosensory signals: power of electromyography (pEMG), galvanic skin response (GSR), heart rate (HR), respiration effort (RE), oxyhemoglobin saturation by pulse oximetry (SpO2), captured from a real baseline user

(see above figure). After experiencing this technical demo, we will invite users to participate in an online survey so as to gain first-hand feedback and elicit user preferences on biosensory information as embodied cues. These feedback will support our subsequent research and future design decisions.

Objectives：

1. Demonstrate a preliminary technical demo that integrates biosensory information with a virtual environment for multi-user metaverse copresent events.

2. Acquire users' feedback regarding their preferences over different levels of granularity and representations of biosensory information for future exploration of embodied social cues.

Target Participants：

People interested in human-computer interaction, VR devices, metaverse socialization, physiological signal expression, and VR gaming

Expected Outcomes：

Participants will be introduced to different biosensory cues and their respective impacts on physiological synchrony and user-perceived copresence. They can go through a metaverse co-presence virtual experience that incorporates biosensory information. Participants' feedback will contribute to our future research and design.

Schedule：

09:00 AM A basic introduction to metaverse socialization, embodied interactive behavior, and physiological signals

09:40 AM VR scene experience

10:00 AM Questionnaire, discussion of result

10:30 AM A basic introduction to metaverse socialization, embodied interactive behavior, and physiological signals

11:10 AM VR scene experience

12:00 PM Questionnaire, discussion of result

工作坊主题：探究生理传感信息作为具身线索在增强元宇宙共在式体验中的应用

萧若薇、吴铭、林琳、吴心怡、张恒斌，Metaphor 实验室，南科大创新创意设计学院
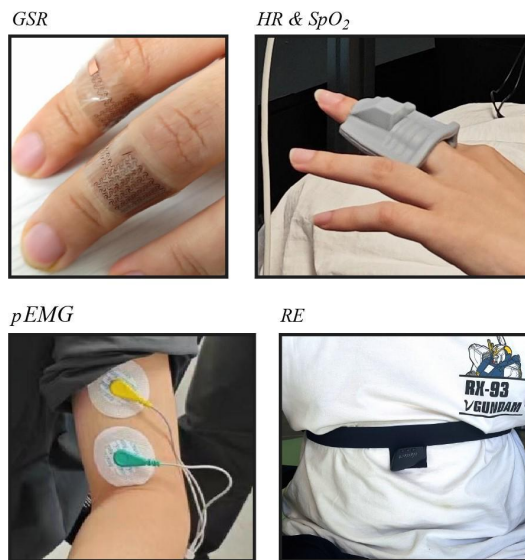
ChCHI 2024 工作坊计划, 11.22

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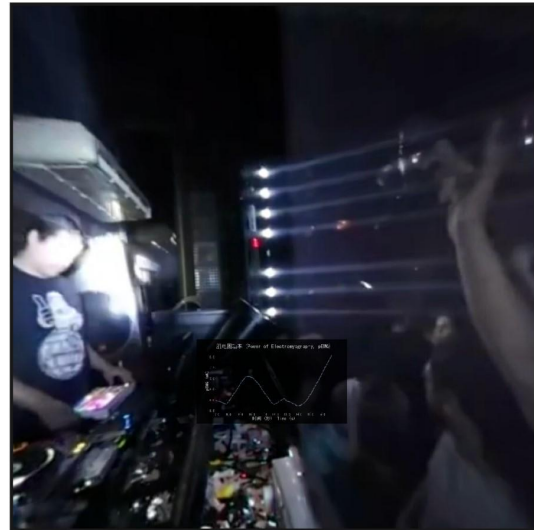
GSR

HR & SpO₂

pEMG

RE

Figure (B). *EDM Scene with Biosensory Cues in 360° VR Environment*

Figure (A). *Power of Electromyography, pEMG*
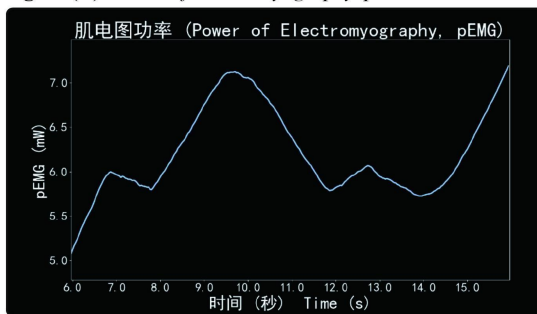
肌电图功率 (Power of Electromyography, pEMG)

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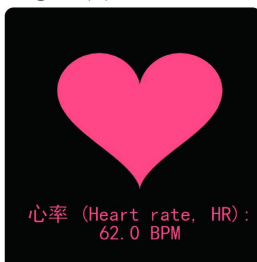
参与者注意事项：

由于 VR 头显数量有限，最多只能有 3 名参与者同时体验我们的案例演示。如果所有设备都被同时使用，新的参与者需要等待前一个环节结束。每个环节预计持续 5 分钟。

设备要求：

参与者需携带笔记本电脑或者平板电脑以方便完成我们的调研。

工作坊持续时间：

9:00 - 12:00 （根据现场实验情况会有少量偏差）

工作坊地点：

南山智园 C1 栋 10 层或 11 层 XXX 房间

工作坊简介：

本研究旨在利用人们的心理生理信息作为元宇宙社交具身线索来增强大型共在式体验。为此，我们需要探索并揭示人们对各类生理数据及其相应表达方式的认知偏好。本工作坊将让每位参与者体验一段在 VR 环境中的 DJ 表演，该表演结合了采集自真实基准用户的五个生理信号：肌电图（pEMG）、皮肤电反应（GSR）、心率（HR）、呼吸强度（RE）、血氧饱和度（SpO2）。在体验完这个技术原型后，用户将会参与到我们的线上调研里，该调研将重点收集用户对于生理数据表达颗粒度和具体表达形式等维度的反馈和偏好，用以支持我们的后续研究和设计决策。

目标：

1. 展示一个初步的技术原型，该技术原型将生理数据与虚拟环境相

结合，用于多用户元宇宙共在式活动。

2. 获取用户对生理数据表达不同颗粒度和表现形式的偏好反馈，以便今后更深入的探索具身交互线索。

目标参与者：

欢迎对人机交互、VR 设备、元宇宙社交、生理信号表达和 VR 游戏感兴趣的与会者体验。

预期成果：

参与者将了解不同的生理数据及其各自对生理同步性和用户感知共存性的影响，并体验整合了生理数据的元宇宙共在式虚拟体验。同时，参与者的反馈将被应用于未来的研究和设计。

日程：

09:00 AM　对于元宇宙社交、具身交互行为和生理信号的基础介绍

09:40 AM　VR 技术原型体验

10:00 AM　在线调研和对结果的讨论

10:30 AM　对于元宇宙社交、具身交互行为和生理信号的基础介绍

11:10 AM　VR 技术原型体验

12:00 PM　在线调研和对结果的谈论