

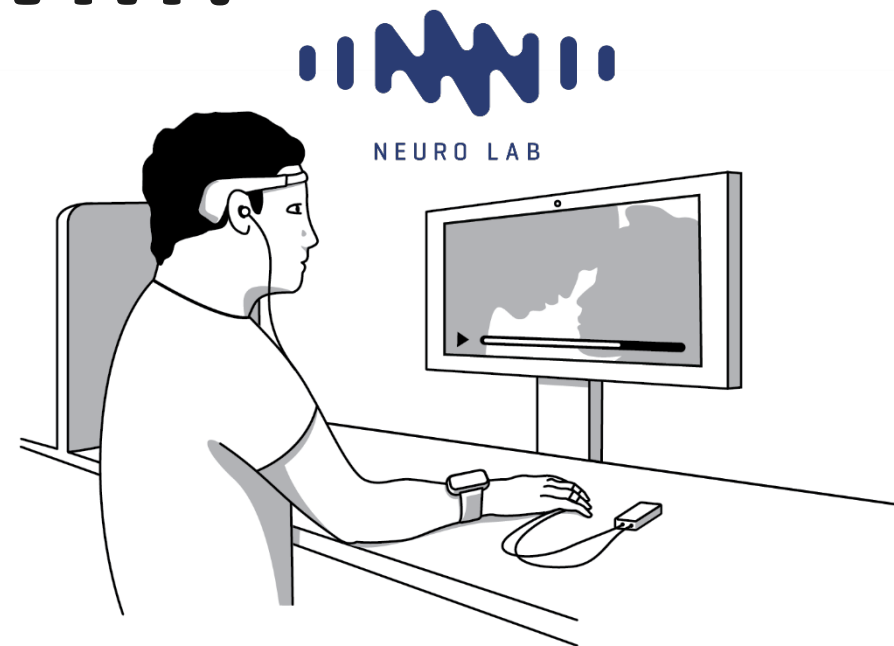
WarnerMedia

BIOMETRIC SIGNALS REVEAL HOW AUDIENCES ENGAGE WITH STORIES

Brian Wellner & Clayton Mosher PhD

WHAT IS NEUROLAB AT WM?

- A division of WM Technology that captures biometric data at scale across multiple platforms.
- We measure audience engagement to improve storytelling.
- We create personalized interactive content.



GOAL OF THIS TALK

1. INTRO TO BIOMETRIC TOOLKIT

galvanic skin response, heart rate, facial coding, etc.

2. CASE STUDY: GALVANIC SKIN RESPONSE

from admin tools to study design and presenting results

3. INDUSTRY STANDARDS AND NORMS

designing methods with an interoperable and scalable approach

4. ETHICAL IMPLICATIONS OF BIOMETRICS

participant privacy and data protection



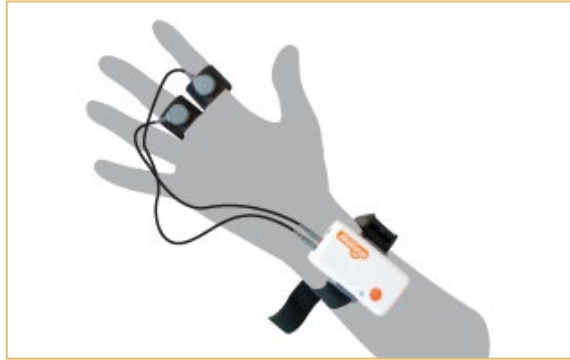
**OUR
BIOMETRIC
TOOLKIT**



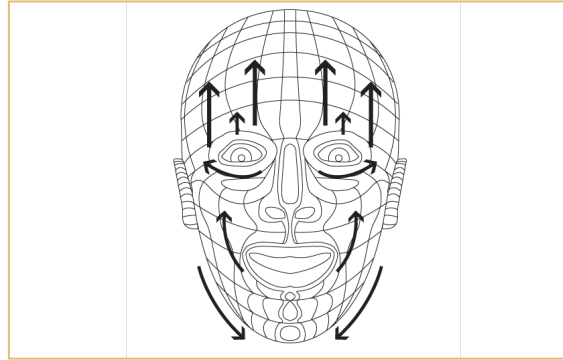
WHAT ARE BIOMETRICS?

Measurements of physiological responses to stimuli which when added to voluntary data, such as surveys, can reveal quantifiable metrics into how audiences engage experiences

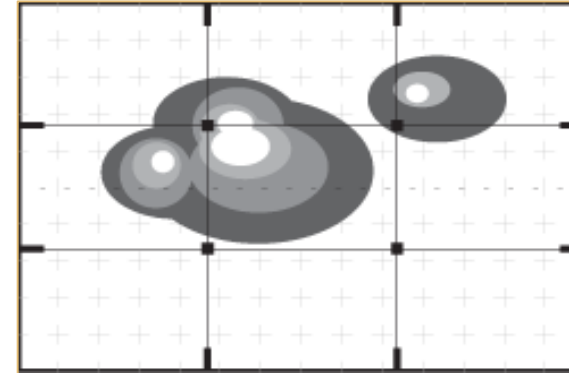
BIOMETRIC SENSORS



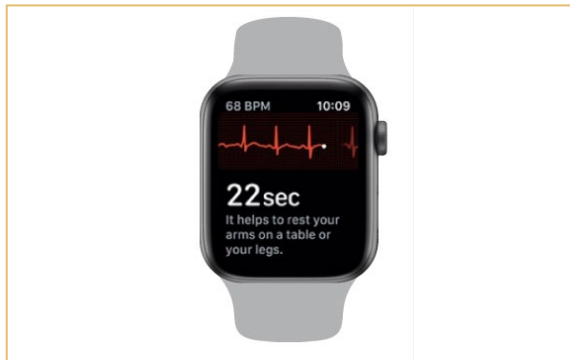
Galvanic Skin Response
Engagement, Identifying Emotional Events



Facial Action Coding
Emotional Response to Content, Valence



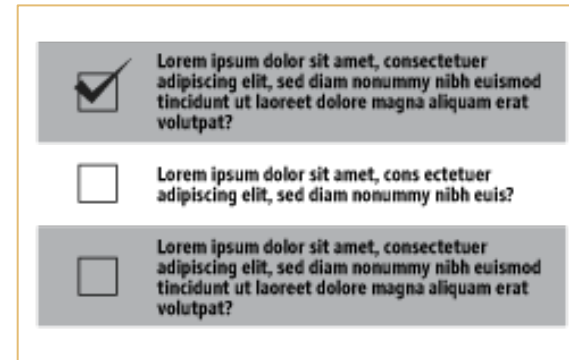
Gaze Tracking
Focus of Visual Attention.



Heart Rate Variability
Anxious and Stressed vs. Rest and Relax



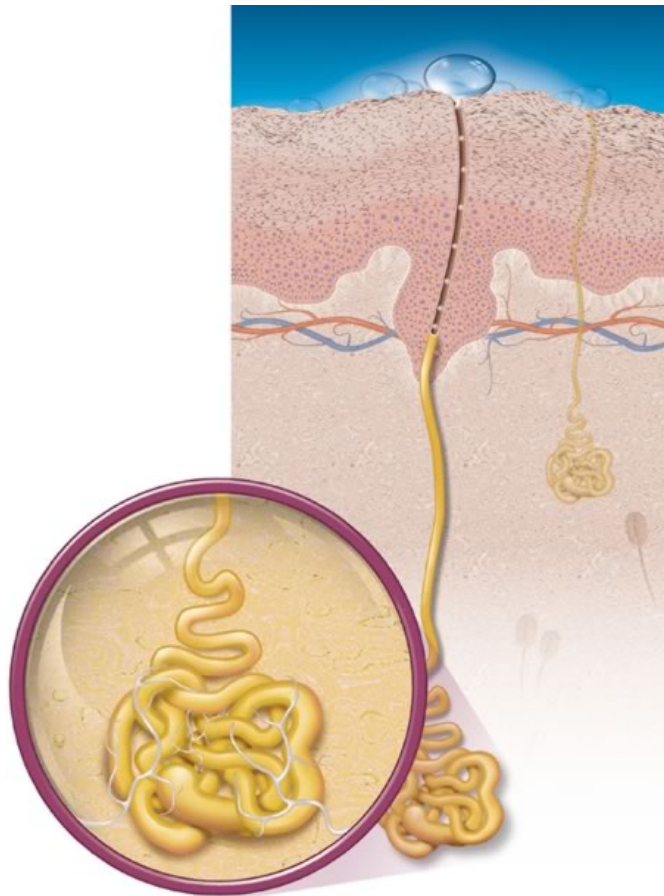
Electroencephalography
Approach/Avoid, Novelty, Interest



Survey and Dial
Self Report

CASE STUDY

GALVANIC SKIN RESPONSE (GSR)



WHAT IS GSR?

- Specialized sweat glands on the palms of the hands and soles of the feet release sweat during strong emotions
- Electricity is more conductive in water. GSR measures changes in the electrical conductivity due to sweat.
- GSR events signal when a person exhibits a strong emotion (arousal)

HOW MIGHT GSR BE USED IN THE MOTION PICTURE INDUSTRY?

- Enhance existing research models that predict box office sales etc.
- Provide feedback to content creators about engaging events
- Provide a tool that is unbiased by language or culture

STUDY ADMIN

Setting up a study

The screenshot displays the 'Study Admin' interface for a session titled 'X1 2:30pm - Simulation'. The session is for 'CES on the Lot - Simulation' and is currently 'Expired'. It is scheduled for September 19, 2021, at 04:43 PM, located at Media Lab, 4001 W Olive Ave, Burbank, CA 91505. The content playlist includes 'Sizzle Reel2 1 Video(s) Total Time 00:00:00'. The consumers list shows 4 participants with columns for Status, Group, Email, First, Last, Age, Gender, and Edit. The settings on the right include Availability (Private), Devices (*ENGAGED app required, Shimmer - GSR, *WB STREAM app required, Iphone - GT), Planned Participants (10), Viewing Type (Shared Viewing), Audio Method (Earbuds), Participation Environment (Audience in the same room), and Calibration Video (Off / On).

SESSION Edit Delete

X1 2:30pm - Simulation
for CES on the Lot - Simulation

🕒 September 19, 2021 04:43 PM 📍 Media Lab
4001 W Olive Ave, Burbank, CA 91505

☰ Notes
FfiqUcclXUqRMsKPRsgmiMhovruoz

📺 Content Playlist (1) - 00:00:00

Sizzle Reel2 1 Video(s) Total Time 00:00:00

Sizzle Reel2 00:00:00 ▶

👤 Consumers (4) +0 +0

Status	Group	Email	First	Last	Age	Gender	Edit
			firstName...	lastsNam...	50-64	F	✎ ✕
			firstName...	lastsNam...	50-64	F	✎ ✕
			firstName...	lastsNam...	50-64	F	✎ ✕
			firstName...	lastsNam...	25-34	M	✎ ✕

Status
🔌 Expired

Consoles
📄 Session Report
🖥️ Video Launcher
🔄 Session Status

Availability
🔒 Private

Devices
📱 *ENGAGED app required
📶 Shimmer - GSR
🍏 *WB STREAM app required
📱 Iphone - GT

Planned Participants
10

Viewing Type
Shared Viewing

Audio Method
Earbuds

Participation Environment
 Audience in the same room

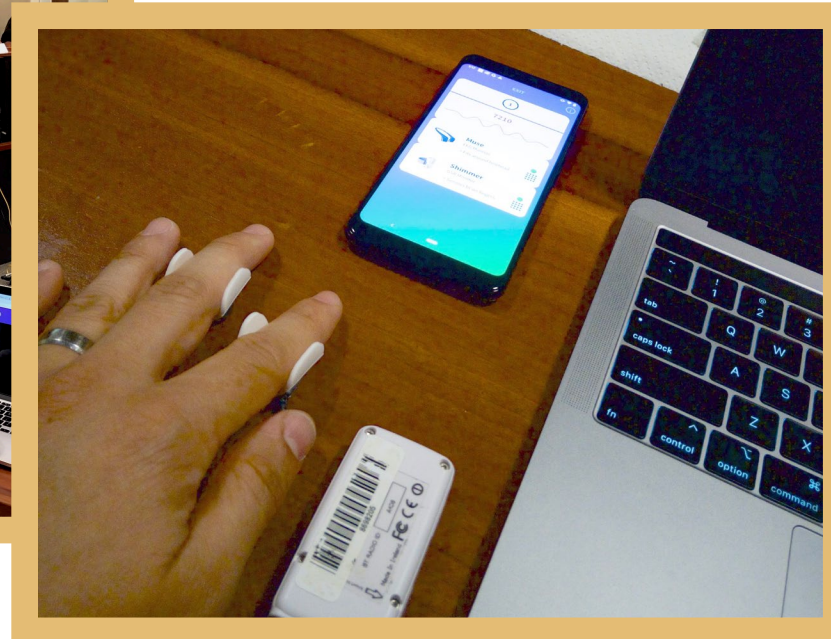
Calibration Video
 Off / On

WHAT TO LOOK FOR IN A SENSOR...

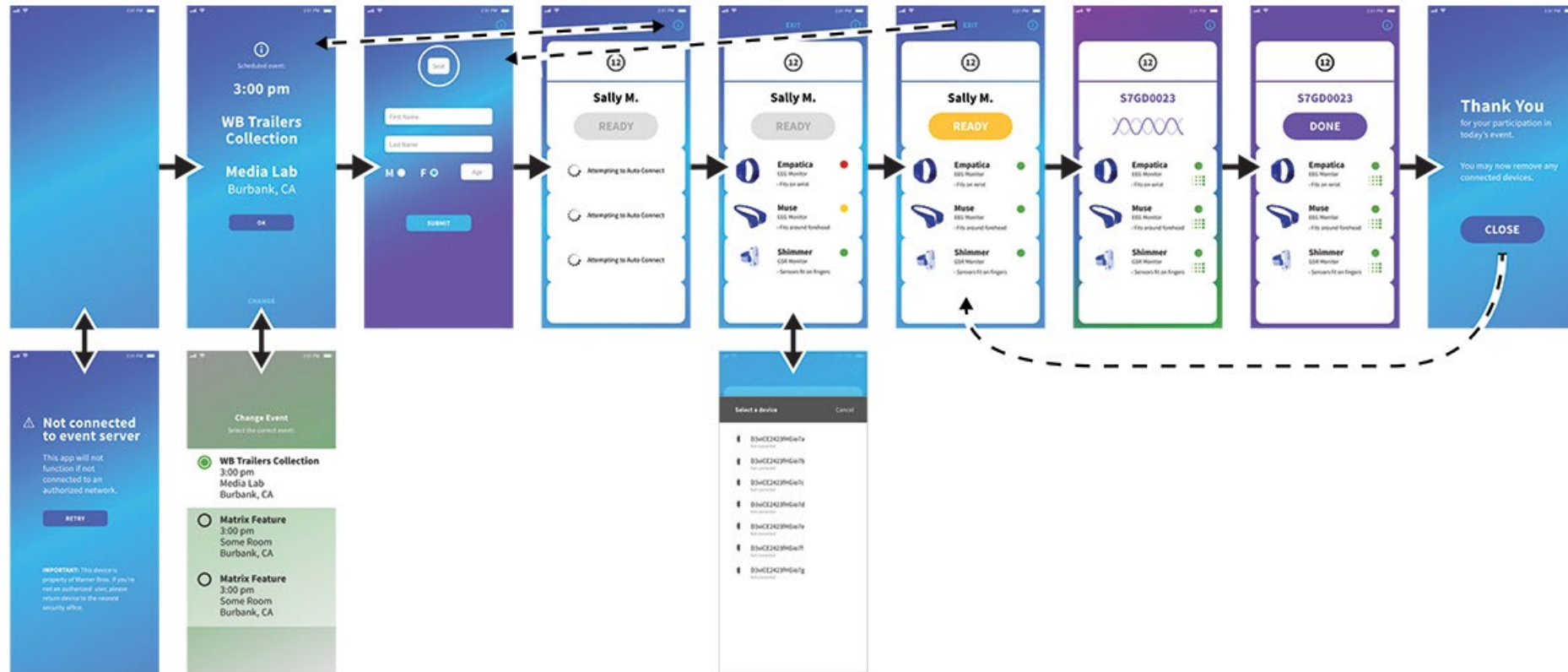
- Wireless streaming of data
- Supports raw data collection
- Adequate sampling rate
- Wearable design
- Sensor is located in optimal location



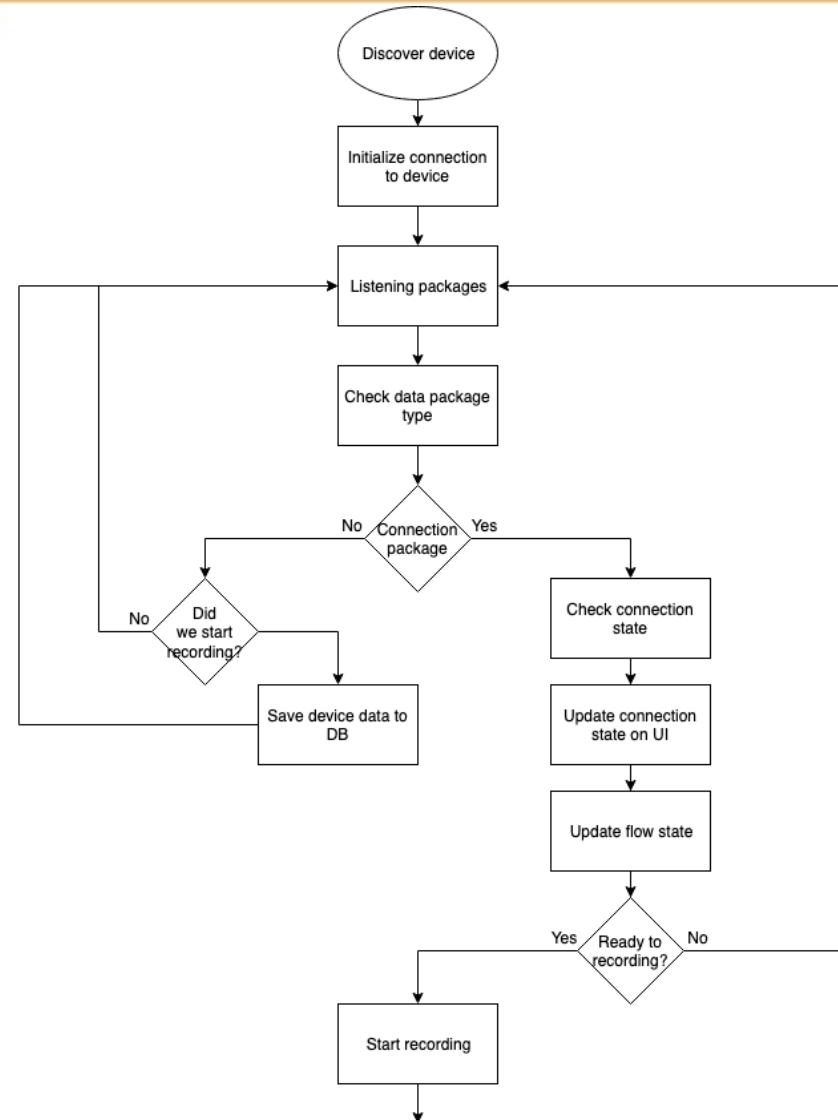
CONNECTING THE GSR SENSOR



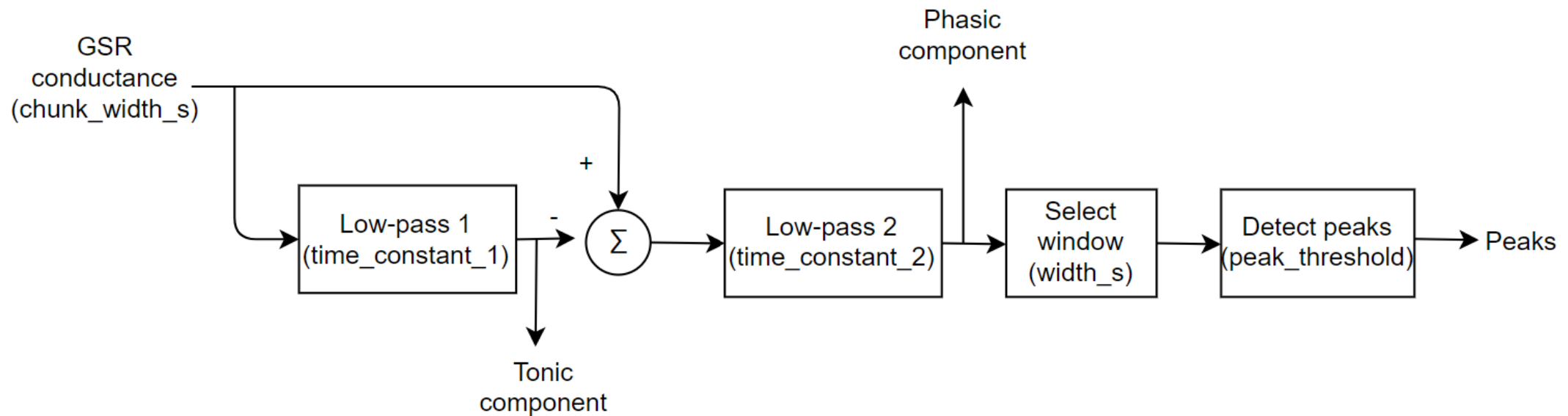
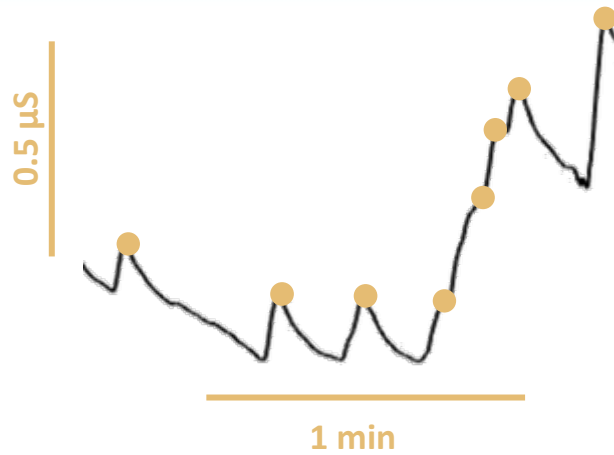
USER EXPERIENCE FLOW



BACK END FLOW OF INFORMATIO N



SIGNAL ANALYSIS





HIGH THROUGHPUT TESTING

Consumer Electronics Show

Report Title

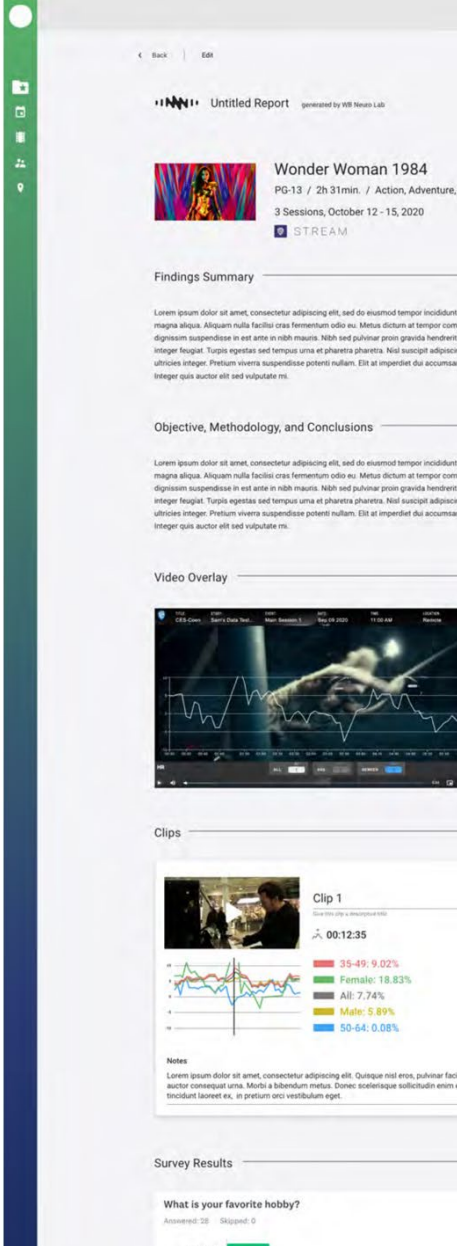
Study or Content Title and Details

Custom Text Boxes

Video Overlay Report

Call-out Clips include:

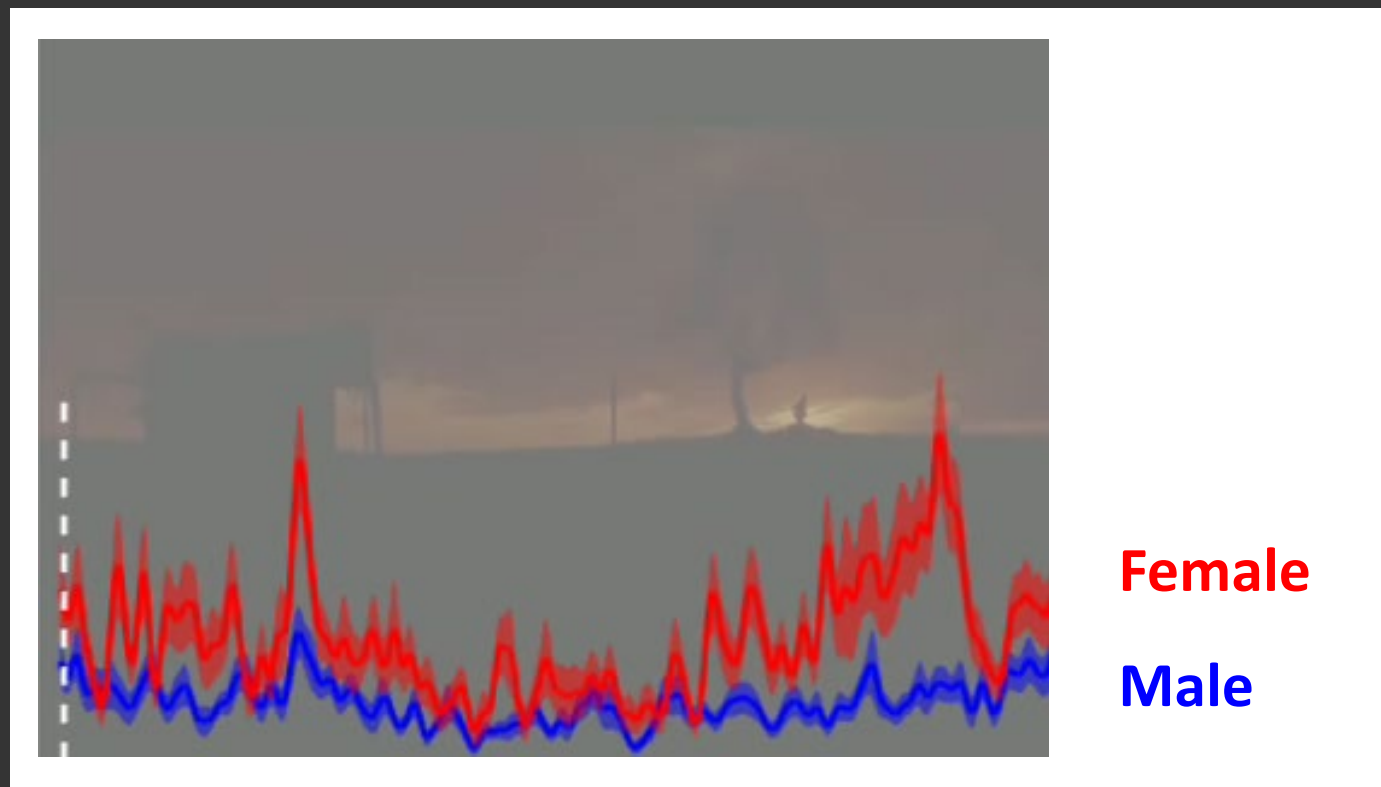
- Time Mark
- Scene Description
- Thumbnail w/ Heat Map Indicators
- Graph Snippet
- Graph legend with explanation for call-out
- Notes



STUDY ADMIN

Snapshot Report

IDENTIFYING TRENDS IN DEMOGRAPHICS



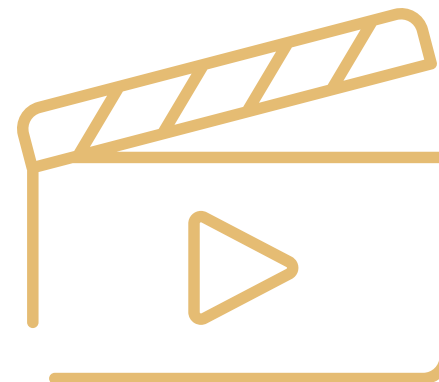


INDUSTRY STANDARDS & BIOETHICS

INDUSTRY STANDARDS FOR BIOMETRICS

To promote intraoperability and collaboration

- Standardize signal processing
- Standardize coding and data transfer
- Syncing data with content
- Evaluating biometric devices
- Norms (gender, genre affinity, IMDB ID, etc...)



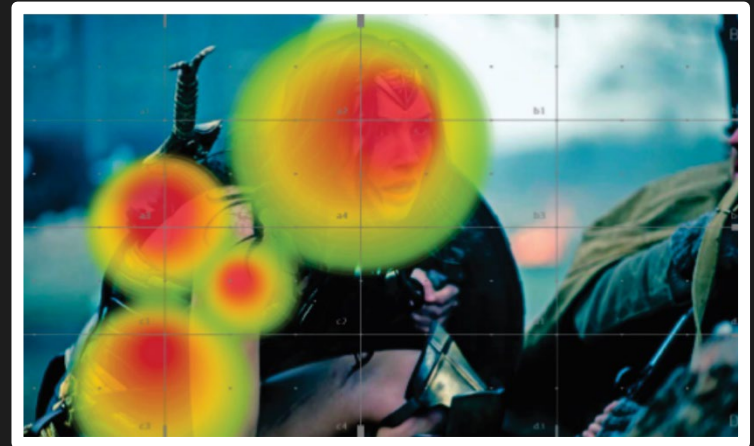


BIOETHICS

- Institutional Ethics Review Board
- Informed Consent
- Anonymizing Data
- Ensuring Data Privacy
- Selling Data

FUTURE DIRECTIONS

- Integrating other sensors with GSR (eye-tracking, heartbeat, facial coding...)
- Building up other platforms (10 ft experience, theater setting)
- Establishing industry wide standards
- Using biometric signals in interactive storytelling



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