

# Metaflow.cc – Towards a Toolkit to Enable Digitalized Emotion Sharing using Wearable Sensor Streams

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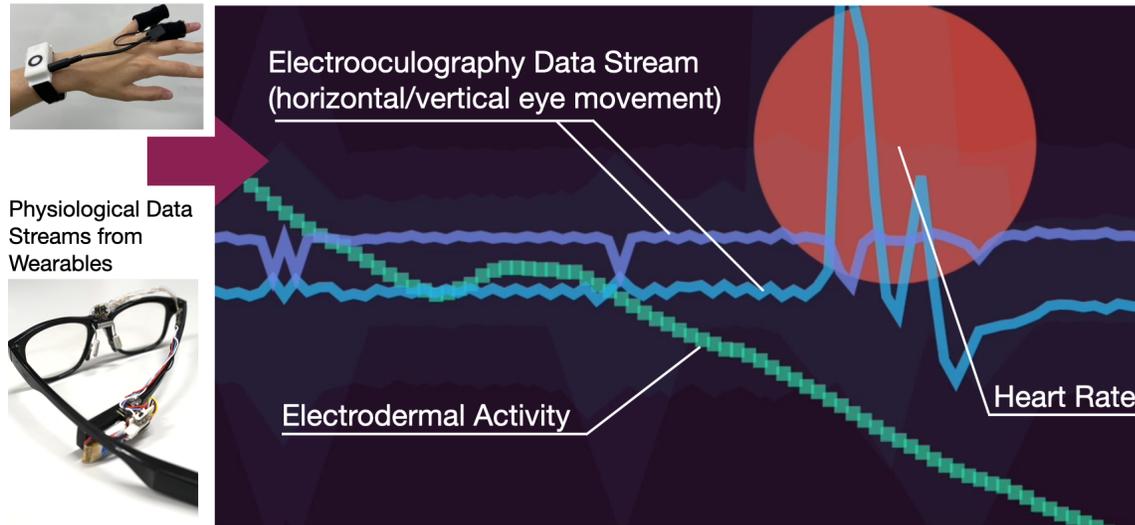


Fig. 1. Early functional prototype to live share physiological data (in this case eye movements, heart rate and electrodermal activity from smart glasses and wrist band), integrating them in a live background that can be used for online meetings and video conferences.

In this paper we present early work on a prototyping toolkit to enable quick, intuitive emotional representations using our physiological data from wearable sensors.

CCS Concepts: • **Computer systems organization** → **Embedded systems**; *Redundancy*; Robotics; • **Networks** → Network reliability.

Additional Key Words and Phrases: datasets, neural networks, gaze detection, text tagging

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## 1 INTRODUCTION

Affective computing researchers often try to classify emotional states or recognise cognitive activities from sensor data [4]. Yet, especially with emotions and affect getting to ground truth information is usually difficult [1]. Was this really the feeling the person had when experiencing these physiological changes? Assigning labels is also tricky, as people might have varying definitions of concepts like “stress”, happiness etc. Therefore a lot of affective research moved towards affective spaces, mapping feelings into 2D or 3D spaces defined by Valence, Arousal, and Dominance or similar dimensions.

We however, plan to follow a different approach suggesting a Metaflow Toolkit to explore physiological responses of our bodies in a more “raw”, direct manner. Instead of employing machine learning techniques to classify physiological data from wearable sensors, we plan to create visualisations, sonifications, tactile actuations and other physical instantiations of sensor features based on our physiology, with little to no classification.

The idea behind this approach is to have people implicitly interpret the sensor data without assigning a particular label (e.g. “stressed versus relaxed”) to it. We think that more abstract representations let people explore their emotional realities more without falling back to concepts like “good” or “bad” behavior, as this in itself might cause extra anxiety. To give an example, take a wrist band monitoring sleep quality. Let’s say the band gives a sleep score from 1 to 10 (restless to restful sleep). A user might feel stressed out just by looking at the low sleep scores before going to bed, maybe leading to a restless sleep. In these cases a more ambiguous display of the data could be better. It also remedies the problem of missclassifications.

## 2 TOWARDS A TOOLKIT TO EXPLORE OUR PHYSIOLOGY

We present an early streaming prototype that can take in a variety of wearable sensor data and displays them as a “live” painting in a virtual canvas. Currently electrooculography sensors from smart glasses, electrodermal activity and heart rate are supported [2, 3]. So far, we have been using the system in several online conferences. Users familiar with the sensor data report that they can detect if the person sharing the data is excited versus relaxed.

The system is JavaScript based, platform independent and can be extended to other actuators and output modalities.

In discussions we are particularly interested in: How to bring the digital physiological data representations into our everyday life? How can we enhance everyday objects and situations with physiological signals? What kind of sensing representations can workshop participants imagine? The toolkit is to enable researchers to prototype these type of questions enabling quick functional demonstrators.

Overall, we plan to build a toolkit that can easily create digital representations of emotional experiences based on physiological signals related to our autonomous nervous system and share these representations to better understand each others emotional realities.

## ACKNOWLEDGMENTS

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