A Tool for Capturing Customized Multi-Pass Emotion Self-Reports while Touching and Telling

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***Abstract*—Human emotions are complex, dynamic and individualistic experiences that evolve over time, making it challenging for devices to accurately estimate personal emotions in real-time. Traditional emotion models that assume generalized emotions exist as discrete states fail to capture the valuable information inherent in the dynamic nature of emotions. We present an interface that supports multi-resolution emotion self-reporting procedures, demonstrating the construction of emotion labels along a custom emotion scale at the rate of emotion change. This procedure differentiates not only what the emotions are, but also how they are transitioning, enabling the identification of emotions such as "hopeful but getting stressed" vs "hopeful and starting to relax".**

***Index Terms*—dynamic emotion labelling, synchronized multimodal affect interaction, emotion classification**

I. Introduction

Modelling affective touch (with optional multimodality support) requires synchronizing multiple data channels; dynamic emotion classification also must incorporate self-report emotion labels to the same timeline [1]. We present a modular emotion dynamic annotation tool that generates experience-aligned high-density time series of dynamic emotion on user-defined emotion scales. We built this tool to label affective touch behaviour during an emotional storytelling episode. As such, the interface features a live touch sensor heatmap, providing valuable potential for building insights on how touch behaviour evolves with emotion from one millisecond to the next – an essential first step to developing affective touch-sensitive devices that respond to dynamic emotions in realtime.

This javascript tool is designed to facilitate emotion studies involving multiple self-report stages, with customisabile modular components for specific study needs [2]. We demonstrate easy synchronization for multimodal data collection, providing support for microcontroller-driven (e.g. Arduino) live sensor synchronization and visualization, including a live heatmap for touch-sensitive interfaces, multimedia custom labeling on timestamps, and audiovisual biosignal sensor synchronization.

Researchers can easily modify modules including label ranking through drag and drop and addition of multimedia stimuli files. Component documentation facilitates customization of input sensor data types and editing of label arrays.

II. Proposed Demonstration

In this demo, we will introduce our data collection and labelling interface, walking through its features as the visitor experiences a multi-pass emotion annotation protocol. We will cover two modules in depth:

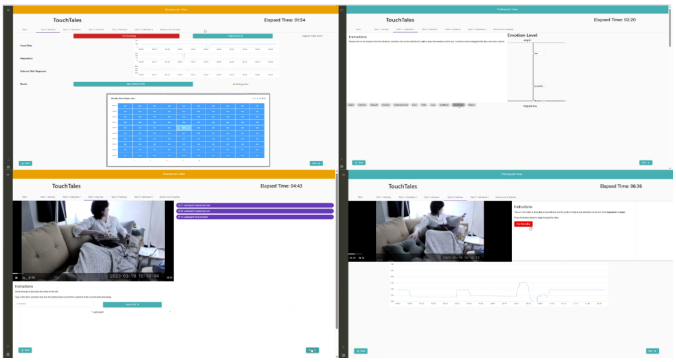

Figure 1: Interface screenshots. Clockwise from top left: live sensor visualization; emotion word calibration; continuous annotation; interview annotation.

(1) Emotion Calibration: To ensure that participants and researchers are aligned in their understanding of an emotion space, we set two ends of a continuous scale as opposing emotions (e.g. *Stressed* and *Relaxed*) and have conference-goers populate the scale with emotion words along that scale (Fig. 1-top right). This forms a custom emotion scale that is specific to the individual and the experience.

(2) Continuous Emotion Annotation: Fig. 1 (bottom right) shows annotation output from a user moving an unbiased joystick up and down, where height marks the proximity of their emotion experience at video time in relation to the custom emotion scale – calibration described above.

Other Modules: The interface also supports text-based video annotation wherein users can pause video and insert comments at a given timestamp, producing a list of annotations and their associated timestamps (Fig. 1-bottom left).

Acknowledgment

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References

[1] X. L. Cang, R. R. Guerra, B. Guta, P. Bucci, L. Rodgers, H. Mah, Q. Feng, A. Agrawal, and K. MacLean, "Feeling (key)pressed: Implicit touch pressure bests brain activity in modelling emotion dynamics in the space between stressed and relaxed," *IEEE Transactions on Haptics*, **under review at ToH short paper - WHC track**.

[2] X. L. Cang, R. R. Guerra, P. Bucci, B. Guta, K. MacLean, L. Rodgers, H. Mah, S. Hsu, Q. Feng, C. Zhang, and A. Agrawal, "Choose or fuse: Enriching data views with multi-label emotion dynamics," in *2022 10th International Conference on Affective Computing and Intelligent Interaction (ACII)*, pp. 1–8, 2022.