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Ethnographic Exploration of Timbre in Hackathon Designs

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***Abstract*— This paper reports a summary account of the *Timbre Tools Hackathon*: a hackathon that invited audio developers and music technologists to consider and work with timbre through the design of tools that promote a timbre-first approach to digital instrument craft practice—*timbre tools*. Through ethnographic observation, we identified different approaches towards integrating timbre as an active part of creating tools and technologies in music. These strategies inform future work and the development of tools to assist awareness and exploration of timbre for instrument makers.**

I. BACKGROUND

Timbre is a foundational element of music, but it is still poorly understood and defined, and timbre models currently used often do not suit design processes. We examined how timbre is used and understood in creative practice, specifically when designing tools for crafting musical expression. This raises interesting and unexplored questions about the role and practice of timbre (*timbre thinking*) in the development and adoption of sound technologies (*design thinking*) and their surrounding sonic cultures. Contemplating technologically and sonic-culturally situated facets of timbre can expand and diversify—and often confront [1]—our understanding of how timbre is perceived, represented, and generated.

Hackathons are time-bounded, low-pressure, collaborative events that present themselves as *observatories of design thinking* [2]. We drew on the notion of *problem space* and *solution space*, which form a general model of the design process [2], to develop our research questions (RQs):

- *Exploring the problem space* - RQ1: How do participants conceptualise timbre in the design of tools for making instruments? RQ2: What (collaborative) strategies do they use to conceptualize their design?
- *Exploring the solution space* - RQ3: How do participants use currently available tools to develop their concepts, and how do their tool choices relate to their understanding of timbre?

II. CONTRIBUTIONS

Eleven teams participated (7 on site, 2 remote, 2 hybrid), totalling 30 participants. Our ethnographic analysis collated field notes and transcripts of both structured and unstructured interviews [3]. We summarise core findings and insights for music and HCI research, drawn from our own reflections and revisiting our RQs. These are exploratory, and limited to the micro-culture within each team. We see our work more as generative, proposing hackathon-like activities and ethnography as a valid method to evaluate nuanced, hazily defined phenomena in the musical domain and beyond.

(RQ1) Metaphors played a crucial role in how teams' shared understanding of timbre was dynamically (re)shaped through social-collaborative interactions (negotiating timbre) but also technological encounters (working with timbre). This highlights the potential of further metaphor exploration in future research on understanding and modelling timbre communication between humans and technologies [4].

(RQ2) Teams approached their designs with different goals, some starting with concrete design objectives and others opting for a more interaction-led collaboration. Spatial formations hinted at different team hierarchies, suggesting a need to study further how social dynamics and collaborative strategies both impact and are shaped by the interplay between timbre thinking and design thinking.

(RQ3) The choice of tools seemed to inform how teams conceptualized timbre in their hacks. Yet, whilst every team had their own way of approaching their design, they had to find a common ground in terms of software, technical representations of timbre, which consequently influenced both design thinking and timbre thinking [1]. Future research could investigate how different audio technologies, and their surrounding sonic cultures, afford or constrain timbre understanding and modelling, and how this influences the design of musical interactions.

III. REFERENCES

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