Integrating Music Therapy Assessment:
From High-Level Reasoning to Computational Frameworks

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Abstract

In recent years, several interdisciplinary research endeavours have aimed to integrate music therapy, computer science, and music psychology to design and implement digital tools for clinical practice in music therapy (Agres et al., 2021; Amorós-Sanchez et al., 2024; Wosch & Magee, 2018). Improvisational music therapy, such as Integrative Improvisational Music Therapy (IIMT), particularly benefits from digital processing due to the complexity and richness of musical and interpersonal data it generates. However, a recurring challenge to use these information in computational frameworks is translating therapists' high-level arguments into low-level computational features – and vice versa – to enable digital systems to provide meaningful information for clinical use (Volk et al., 2023). This particularly applies to microanalytic analysis methods, which are well suited to clinical scenarios but often lack the formalisation needed for integration into computational frameworks.

Over the past three years, a tool has been developed for the *Computational Assessment of Musical Interaction in clinical Improvisation* (CAMII) based on an interdisciplinary model (Vobig, 2025), that combines microanalytic methods of music therapy (Improvisation Assessment Profile - Autonomy Microanalysis), digital tools for the analysis of clinical improvisation (Music Therapy Toolbox), and sociological models (Social Systems Game Theory). Using supervised machine learning, CAMII analyses MIDI data from dyadic piano improvisations conducted in out-patient depression treatment and synthesises this data to identify different types of musical interaction, aiming to characterise interpersonally related individual musical behaviour of both client and therapist. Throughout the development, various processes have been employed to formalise and translate therapists' high-level reasoning in microanalysis into computationally feasible information.

The presentation submitted showcases the development and functionality of the CAMII system, with particular emphasis on the formalisation processes used to transform manual auditory assessment of musical interaction into an automated digital tool. (287 words)

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Presentation Format

We would prefer to present orally but could opt for a poster presentation instead.