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What Makes a Performer Unique? Idiosyncracies and Commonalities in Expressive Music Performance

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SUMMARY

WHAT MAKES A PERFORMER UNIQUE?
Idiosyncrasies and commonalities in expressive music performance

This thesis investigates the production and perception of idiosyncratic expressiveness in music performance. In particular, it studies how performers' expressive use of tempo and loudness is constrained by their idiosyncratic style and by the score.

The first chapter introduces the subfield of expressive performance modeling under the umbrella of systematic musicology, outlines alternative definitions of expressiveness, and motivates the research presented in the dissertation.

The second chapter presents a proof of concept study showing insights in the expressiveness consistency of timing and loudness of individual performers, as well as alternative methodologies to analyze expressive performances.

The third chapter offers a review and introduces several key concepts on the field of machine learning and computational modeling with applications to music performance analysis and modeling.

The fourth chapter contains a study concerning the analysis and modeling of expressive tempo and loudness at score markings, as either independent or interacting features, within the frame of idiosyncratic expressiveness. The results show that both tempo and loudness were better predicted by the models used when these were trained on several performers playing a given piece (i.e., using piece-based models) than when the models were trained per performer playing various other pieces (i.e., using performer-based models). The results also indicate that both tempo and loudness were mostly better predicted at score markings when tempo or loudness values prior to the marking were also included as predictors. These findings suggest that, within the context defined by the dataset, performers plan and direct their expressive gestures on tempo and loudness towards the score marking, possibly as a structural phrasing inflexion. Yet, it was also observed that tempo and loudness did not - in most cases - seem to interact among the score indications tested, in either piece- or performer-based approaches. This finding invalidates the hypothesis that tempo and loudness interact at score markings, at least within the context of experiments presented.

The fifth chapter studies whether individual performers' use of tempo and loudness - and the interactions between them - is constrained by the meter or the melodic rhythm specific to the score. In addition, an assessment as to whether the idiosyncratic use of expressive tempo or loudness is better predicted by performer-based models, as opposed to piece-based models, is offered. Furthermore, this chapter motivates the use of sequential models, and in particular, Long Short-Term Memory networks, to better approximate the nature of music making and listening. The results indicate that

piece-based models lead to better predictions compared with performer-based models. This suggests that performer expressiveness within a given piece is more strongly constrained by musical structure inherent to the score than by stylistic idiosyncratic expressiveness of a given performer per se. The results furthermore indicate that metrical structure constrains the expressive gestures of loudness and tempo as interacting features on long and short-term expressive phrasing. Moreover, the interactions between tempo, loudness and meter allow for predicting both tempo and loudness better than when using tempo and loudness as combined features. However, when meter was not accounted for, interactions between tempo and loudness were not discernible. Such results suggest that metrical structure constrains the expressive gestures of loudness and tempo and how these two aspects of performance interact. In this regard, it elucidates on how a listener's expectations of tempo and loudness might be constrained by salient structure of the score, beat position and meter perception.

The sixth chapter includes a perceptual experiment on the role of expressive tempo and loudness (as independent or interacting features) when discriminating between two different performers and reflects on design and methodological challenges encountered. Finally, the seventh chapter recapitulates the contributions of this dissertation.