Instrumental Blending in Concert Halls
A Literature Study about influencing Factors

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Abstract
A common stylistic device in music is to blend the sound of one instrument into another's in order to create an array of timbres. This effect ranges between an analytical impression, in which both sources remain distinguishable, and the effect of a completely obscured sound. A literary study was conducted to investigate multiple influencing factors. Throughout the course of this project, listening tests will be conducted with musicians and experienced listeners for the purpose of investigating the influence of concert hall acoustic to blending.

Conclusions
- Blend depends both on early reflections and on late reverberation.
- Influence of late reverberation
  - Lower spectral centroid \(\rightarrow\) blend of timbres [7]
  - Modulation depth decreases \(\rightarrow\) less articulation and more continuity \(\rightarrow\) less stream segregation
  - Exceeding level of late energy \(\rightarrow\) "Obscured" or "muddy" sound.
- Influence of early reflections
  - from the ceiling: support localization and decrease blend
  - from side walls: increase blend due to source location confusion and higher ASW

Perception of blend might be related to listener categories as in [12]:
- Fundamental pitch listeners (who hear rather the fundamental in a tone complex)
- Spectral pitch listeners (who hear rather the overtones)

Follow-up
- 2AFC listening experiments
- SRIR from Aalto SDM measurements of concert halls
- Auralization in listening room via loudspeaker set-up

References

Figure 1: Overview of factors, that influence blend. \# signs cross refer to other boxes.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure1.png}
\caption{Overview of factors, that influence blend. \# signs cross refer to other boxes.}
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