Scheduling and dynamic time structures in computer-assisted composition

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Music composers’ work with computers is generally divided in the two distinct stages of composition and performance. Each stage requires specific methodology and software: computer-aided composition involves time and high computation capabilities to produce complex musical scores, while performance and live rendering require reactive environments with precise real-time constraints. Contemporary music composers permanently challenge these kinds of established categories, using unusual objects and behaviours in their music or considering the variations in performance as an actual part of the composition.

Among the main issues in designing software capable of such a combination of technologies are for instance the considerations of dynamic evolving behaviours across time in musical structures, the possibility to perform high-level computations coupled to real-time constraints, or the display of complex and non-deterministic information. My research project in the Center for Computer Research in Music and Acoustics (CCRMA) at Stanford involves programming languages, music representations and human-computer interactions. It aims at coming up with new concepts and outlooks on computer music composition with an emphasis on temporal structures and scheduling.