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Assignment 4

## **Reading Questions**

*What is MIDI-audio alignment?*

MIDI-audio alignment, a type of score following, refers to the process of aligning a sequence of audio to a sequence of MIDI data.

*What techniques are typically used for MIDI-audio alignment?*

Dynamic time warping and hidden Markov models are common historical techniques, and “recently more complex graphical models have been explored.” Dynamic time warping is a type of dynamic programming algorithm used to align two sequences “given a matrix of compatibilities between all pairs of elements in the sequences and rules for valid differences between the sequences.” Hidden Markov models are graphical models in which “a hidden state variable completely determines the distributions of both the observed variables at a moment in time and the next state in the sequence.”

*What is the difference between online and offline alignment?*

Online alignment occurs with respect to real-time audio, while offline alignment uses pre-recorded audio files.