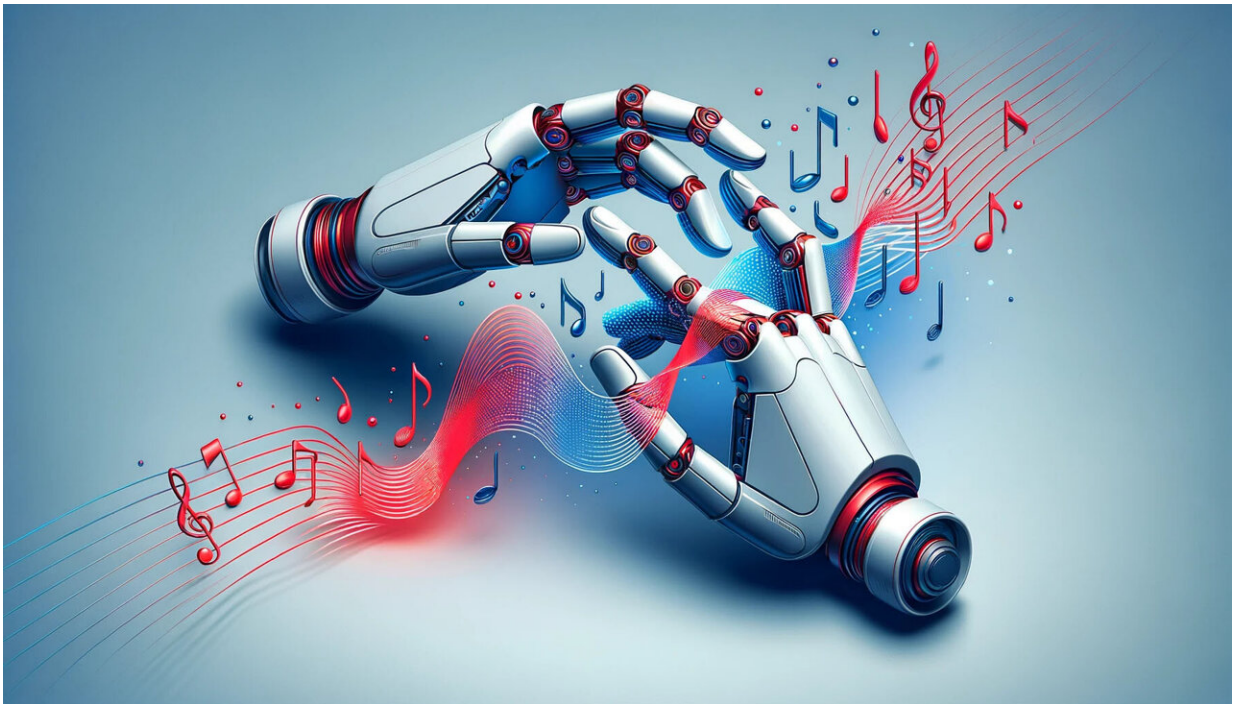# Software DJ creates automated pop song mashups

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The algorithm works to isolate and blend individual components from multiple songs to produce a unique composite with a pleasing sound. Credit: Xinyang Wu.

Song mashups are a staple of many DJs, who mix the vocals and instrumentals from two or more tracks into a seamless blend, creating a new and exciting final product. While the result is fun to listen to, the creation process can often be challenging, requiring knowledge and expertise to select the right tracks and mash them together perfectly.

Xinyang Wu from the Hong Kong University of Science and Technology took a different approach, designing a [computer algorithm](#) to intelligently create mashups using the drum [tracks](#) from one [song](#) and the vocals and instrumentals from another. He presents his work Dec. 7 as part of [Acoustics 2023](#), running Dec. 4–8 at the International Convention Center Sydney.

While some algorithms and automated [software](#) can attempt to create song mashups, their results are often clunky and unrefined. These methods layer the complete, unaltered tracks on top of each other, aligning them based on detected key moments in the music, rather than skillfully combining the vocals and instrumentals of different songs.

"Imagine trying to make a gourmet meal with only a microwave—that's sort of what automated mashup software is up against compared to a pro chef, or in this case, a professional music composer," said Wu. "These pros can get their hands on the original ingredients of a song—the separate vocals, drums, and instruments, known as stems—which lets them mix and match with precision."

His [algorithm](#) takes a different approach, mimicking the process used by professionals. The software works to isolate the stems from each song and identify the most dynamic moments. It adjusts the tempo of the instrumental tracks and adds the drum beat mashup at exactly the right moment for maximum effect.

The result is a unique blend of pleasing lyrics and exciting instrumentals with wide-ranging appeal.

"From what I've observed, there's a clear trend in what listeners prefer in mashups," said Wu. "Hip-hop drumbeats are the crowd favorite—people seem to really enjoy the groove and rhythm that these beats bring to a mashup."

Now that the software has been tested on drum tracks, the team plans to tackle bass mashups next. For Wu, the dream is to expand the algorithm to incorporate the full instrumental suite and put user-friendly mashup technology directly into the hands of listeners.

"Our ultimate goal is creating an app where users can pick any two songs and choose how to mash them up—whether it's switching out the drums, bass, instrumentals, or everything together with the other song's vocals," said Wu.

Provided by Acoustical Society of America

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