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Insect swarming inspires jazz software

08:00 06 May 2002 by [Duncan Graham-Rowe](#)

Jazz musicians who enjoy freeform improvisation may soon be using computer software to accompany themselves. A team at University College London has written a program that mimics insect swarming to "fly around" the sequence of notes the musician is playing and improvise a related tune of its own.

The Swarm Music program is the creation of computer scientists Tim Blackwell and Peter Bentley, who study how natural processes can be modelled in software. The pair believe that improvised music is self-organising in the way swarms of insects and flocks of birds are.

Their software works by treating music as a type of 3D space, in which the dimensions are pitch, loudness and note duration. As the musician plays, a swarm of digital "particles" immediately starts to buzz around the notes being played in this space - in the same way that bees behave when they are seeking out pollen.

Formation flying

Periodically, the position of each particle is translated into musical notes or chords which are played back to the musician a beat or so later. Just by following a few very basic insect-like rules, such as "move towards the centre of the swarm" and "do not bump into any other members of the swarm", the software plays music that the inventors say "is hard to believe is not of human origin".

"Particles sometimes fly in formation so you can get repeated riffs emerging," says Blackwell. The particles are encouraged to overshoot their targets slightly, to make the result sound more pleasant, he says. If the particles hit their targets too quickly, you end up with a parody of what's just been played.

The result is not everyone's cup of tea - but then nor is freeform jazz. Staff in the **New Scientist** newsroom could only agree that Swarmusic in action sounded "alternative".

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