

Researchers synthesize sound from electrical energy of slime mold

December 12 2012, by Bob Yirka



Photo of an example setup. The reference electrode is on the right side. The other 8 electrodes are measurement electrodes. They are covered with blobs of non-nutrient agar and oat flakes placed on top of each. At the beginning, a piece of plasmodium is placed on top of agar blob covering the reference electrode only (indicated by the dashed circle). Credit: arXiv:1212.1203 [nlin.PS]

(Phys.org)—Researchers with the Interdisciplinary Centre for Computer Music Research at Plymouth University in the UK have created a form of music based on the electrical output of the common slime mold. By inducing the mold to grow protoplasmic tubes over electrodes, the team writes in their paper uploaded to the preprint server *arXiv*, they were able to capture the electrical activity the process generates and convert it to a form of music.

The slime mold has been the subject of intense scrutiny over the past

several years as researchers have discovered its unique networking abilities. Slime molds move by generating protoplasmic tubes that span part of the distance between itself and a place it wants to go; namely, a food source. Researchers have found that this simple action can allow the mold to find its way through a maze, for example, or mimic the design of highway systems in urban areas. Now, researchers have found that because the creation of the tubes involves internal [electrical activity](#), it's possible to allow the mold to create music of a sort, as well.

The researchers placed the mold in a [Petri dish](#) along with several [electrodes](#) – each with a [food source](#) placed on top of it to attract the mold. As the mold generated protoplasmic tubes as it moved over the electrodes, the electrical energy released was recorded – once per second. The recorded signals from the electrodes were eventually fed into an audio oscillator, with each recording representing a different frequency. By mixing the sounds generated from all of the recordings the researchers were able to create an eerie type of music – reminiscent of the sound effects used on early science fiction movies. As an added feature, the researchers report that they can cause different sounds to be generated by shining light on different parts of the mold, in effect tuning their bio-instrument to allow for the creation of different types of music.

Because it can take a week for the [slime mold](#) to cover the electrodes, the researchers have fed what they've learned about the process into a computer where it can be simulated – allowing for the creation of similar music in a much quicker way.

More information: Sounds Synthesis with Slime Mould of Physarum Polycephalum, arXiv:1212.1203 [nlin.PS] arxiv.org/abs/1212.1203

Abstract

Physarum polycephalum is a huge single cell with thousands of nuclei, which behaves like a giant amoeba. During its foraging behaviour this

plasmodium produces electrical activity corresponding to different physiological states. We developed a method to render sounds from such electrical activity and thus represent spatio-temporal behaviour of slime mould in a form apprehended by humans. We show to control behaviour of slime mould to shape it towards reproduction of required range of sounds.

via [Arxiv Blog](#)

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