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A Novel Tool To Generate Fine-Grained Acoustic/Audio Data

Reinforcement learning audio GAN generating fine-grained synthetic data for health, security, and ecology.

Researchers at Purdue University have developed a new technology combining reinforcement learning with an auxiliary classifier integrated WaveGAN (RL-AC-WaveGAN) to generate magnitudes of fine-grained synthetic audio/acoustics data in a timely manner that can be leveraged in a variety of applications, including healthcare, outbreak detection, pest control, vector-borne disease control, security, andauthentication. Existing WaveGAN-based models can generate synthetic audios for distinctive classes, such as different musical instruments, but they cannot capture the differences among classes that are very similar, such as wing flapping sounds of mosquito species or cough sounds of patients with different respiratory diseases. This innovation developed at Purdue can instead generate large-scale, fine-grained authentic audio and acoustic data to catch subtle variation among closely varying classes of sounds.

Technology Validation:

With a detailed analysis of five public multi-class insect and human datasets, the researchers found that the RL-AC-WaveGAN outperforms state-of-the-art (SOTA) baselines, generating authentic fine-grained synthetic audio samples resembling original samples.

Advantages:

-Capable of capturing unique, class-specific features

-Produces realistic, class-conditional audio data

Applications:

-Healthcare

-Outbreak detection

Technology ID

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Category

Artificial Intelligence & Machine Learning/Audio Sensing & Signal Processing

Digital Health & Medtech/Health Informatics

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View online

-Pest control

-Vector-borne disease control

-Security and authentication

-Remote patient care

-Security and authentication

-Soundscape ecology and biodiversity

TRL: 3

Intellectual Property:

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