Realtime Generation of Audible Textures Inspired by a Video Stream

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GitHub
git.io/fh1ng

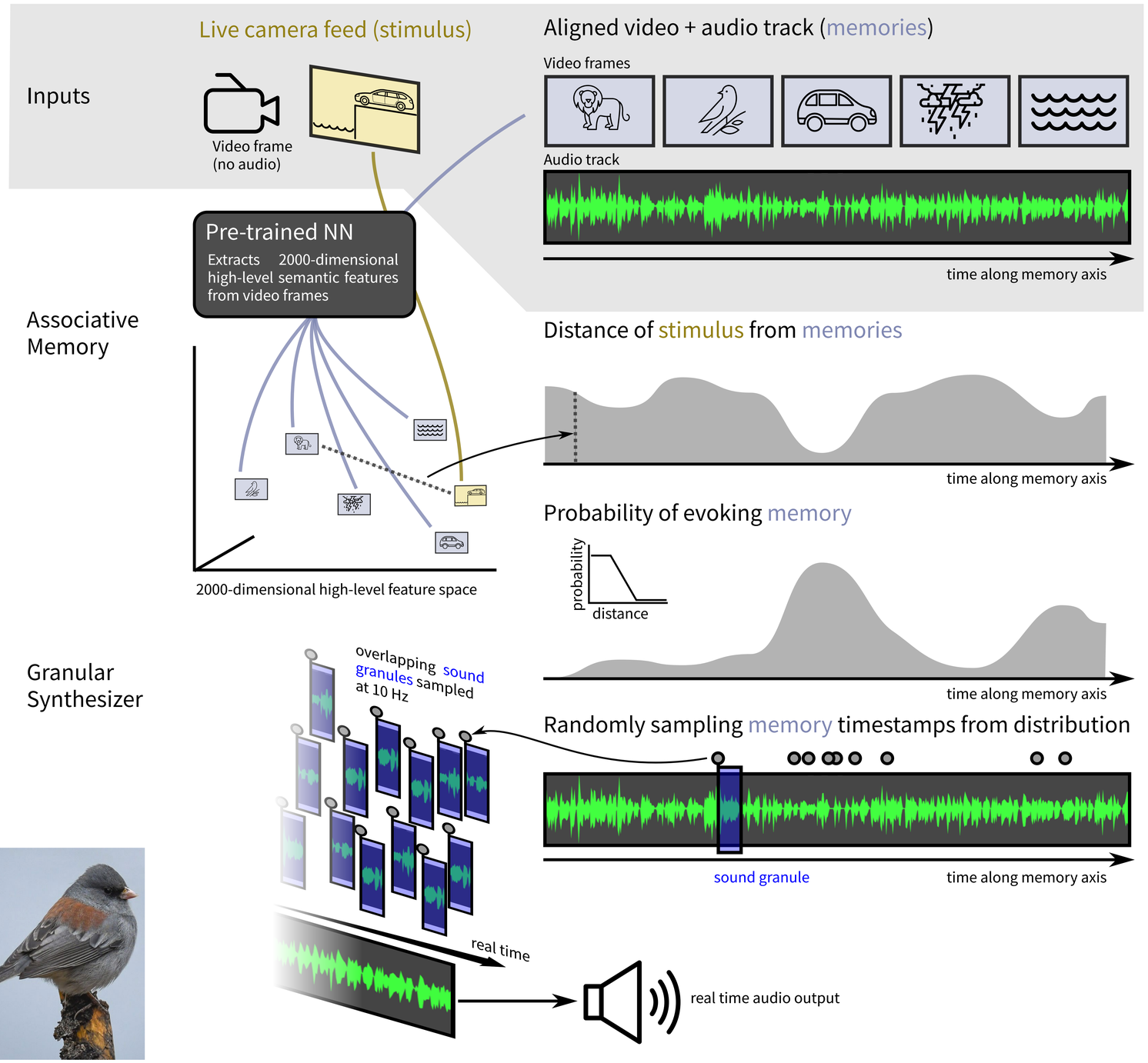
Abstract

We showcase a model to generate a soundscape from a camera stream in real time. The approach relies on a long training video with an associated meaningful audio track; a granular synthesizer generates a novel sound by randomly sampling and mixing audio data from such video, favoring timestamps whose frame is similar to the current camera frame; the semantic similarity between frames is computed by a pre-trained neural network.
The demo is interactive: a user points a mobile phone to different objects and hears how the generated sound changes.

Sound Generation

A granular synthesizer produces a continuous soundscape by randomly overlaying many short sound samples with a length between 1 and 1000 ms; each granule is too short to be perceived as an individual entity, but long enough to meaningfully contribute to the resulting sound.
Granules are sampled at random times from a source audio and played with soft attack and release transients, in order to better blend them in the overall texture. We use a granule length in the range between 100 and 1000 ms, and we start the playback of new granules at approximately 10-30 Hz (so that about 3 to 10 granules are overlayed at any given time): at these settings, the character of the resulting sound is pleasant and reminds the character of the audio from which the granules are sampled from, without the source being recognizable. **To affect the sound character, we manipulate in real time the probability distribution from which the synthesizer samples the starting points of the granules to be played next**.

Explore your environment! What do you hear?



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Icons from the Noun Project: Sea by Daria Moskvina, Lion by Iconic, Bird by Laymik, Car by Vladimir Belochkin, videocamera by Ralf Schmitzer, family car by Setyo Ari Wibowo, loudspeaker by Stock Image Folio

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