"Ultrasonic Scapes" is based on both a fascinating and fascinatingly simple concept. When and how did you strike upon the idea? I'm also curious about to what end you bought a bat detector in the first place – was it originally just to record bats or did you always have some other plans for it as well?

I have been interested in the sounds beyond our audible range. Human can hear sounds from about 20 Hz to 20 kHz, but the sound world can't be limited to that range. For example, inaudible high-frequency components are abundant in the sounds of nature and acoustic instruments such as tropical rain forests in Amazon and gamelan ensembles in Indonesia. And many animals can hear beyond 20 kHz. For example, dogs and cats can hear sounds up to about 60 kHz and marine mammals such as dolphins and whales can produce and hear sounds beyond 100 kHz. I imagine human being could hear much higher frequency in the primitive age, assuming we had to hear the subtle signs of dangerous enemies approaching. And as it seems to be a controversial scientific topic, recent study showed sounds containing rich 'inaudible' high-frequency components affect the brain activity of the listeners, which is called 'hypersonic effect' (see paper written by Tsutomu Oohashi et al.).

Except for some animals such as bats and dolphins, it is still largely unknown how ultrasounds are produced and used by animals, insects etc. Also I'm curious how they sound like if I could listen anyway. So at first I was motivated by scientific curiosity as well as artistic practice. I searched online and found some of the microphones can record sounds well beyond 20 kHz, such as Earthworks qtc50 and Sanken co-100k, but I couldn't afford to buy them. And I found bat detector is the easiest way to capture and listen to the ultrasounds so I bought one from Pettersson.

Though at first I was interested in the sounds with inaudible high-frequency components in nature, I was not particularly interested in bats. I went to the forests and small mountains in Kyoto to listen to and record the nature sounds using bat detector. I found inaudible high-frequency components are abundant in the calls of some animals, chirping of insects, sounds of streams, waterfalls and trees blown by the winds etc. Then I took the bat detector in the street and monitoring the sounds with headphones while walking around, I realized the street itself was full of ultrasonic sounds produced by walker's accessories, bicycles, cars, electronic devices and illuminations etc. They disappeared as suddenly as one appeared and changed the pitch as I turned the frequency dial. Some were metallic clatter sounds and others were continuous drone and monotonous beats etc. Anyway it opened a whole new world to me.

"Ultrasonic Scapes" is actually based on my film work I made in the end of 2008, which called "UltrasonicScapes" (not "Ultrasonic Scapes"). "UltrasonicScapes" focused on ultrasounds in my daily life and it is a third film of my series of acoustic films called "Scapes series" which aim to describe acoustic environment in Kyoto. I use the term 'acoustic film' as the film focusing on acoustics, listening, sound environment, field recording etc...

I connected line out of my bat detector into the audio input of my HDV camcorder so that I could record the images and converted ultrasonic sounds at the same time. I didn't apply any post processing so the recordings are what I listened with bat detector at that moment. Though it's quite compressed and not the final version, you can watch the movie here . And later in 2010, I recorded some more ultrasounds in Tokyo and compiled them for the gruenrekorder release.

You could, of course, hold a bat detector to about anything, but not every object or animal has equally interesting ultrasonic properties. How much experimentation was involved in selecting what to record? Did you, after a while, develop a certain sensibility for interesting audio scenes? Presuming you recorded more than what ended up on the final release, what were criteria for what to put on and what to leave out?

I usually like to listen and record something 'beautiful' to my ears. I use many different microphones for recording in the field because I'd like to find and record subtle acoustics in each particular environment which are often hidden and not noticeable in the conventional listening. Bat detector is one of the microphones I use to explore the possibility of listening and capturing the world beyond our physical ears. As I listened to the world through various microphones, I may have gradually developed the certain sensibility for the environment.

As already mentioned, at first I went to the forests and small mountains in Kyoto to search for inaudible sounds. I found some insects as cicadas and crickets produce sounds with rich inaudible high-frequency components. Especially cicada chorus is so loud and intense in the ultrasonic range as if I was listening to noise ensembles by hundreds of cicadas. And I also found the calls of some frogs, birds including owls go beyond our audible range but usually not very apparent as they produce weak signals or usually not close enough to me. Sounds of streams, waterfalls and trees made by the wind also go in the ultrasonic range but it is not particularly interesting as well so I didn't include them in the track. Along the Kamo River in Kyoto in the late afternoon, I found many bats wildly fluttering around and I could record their characteristic ultrasonic calls. I couldn't even notice they were the bats before I listened with bat detector.

Then I took the bat detector in the street and captured ultrasounds produced from various kinds of electronic devices, fluorescent lights, and anything making jingle-jangle sounds which are often not heard at all by our ears. I also recorded ultrasounds emitted from TV, computer and other electronic devices in my living room. Then I selected the recordings considering the variety and uniqueness of the sounds.

Since one or two reviewers wondered about the subject, what does the bat detector do to convert the ultrasonic sounds into the audible range? In which way are these sounds already an "interpretation"? Or, as Cyclic Defrost's Joshua Meggitt asked: "Doesn’t changing the frequency in such a way [referring to the bat detector's conversion] completely alter the nature of the original source sound?"

Bat detector function as a microphone and converter allowing us to listen to the ultrasounds. As far as I know, there are 3 types of bat detectors depending on the types of conversion as heterodyne, frequency division and time expansion bat detectors. Each type converts ultrasonic sounds into audible range differently. You can know the functions of different types of bat detectors on wikipedia. I use a heterodyne bat detector because it works in real time, has good sensitivity, is easy to use and the least expensive. It seems each model has different sound character even in the same types of detectors.

I understand heterodyne bat detector can’t keep the original waveform as time expansion ones do, but I don’t think the one I use completely alter the nature of the original source sound. As you listened to the cicada recording, for example, you can hear the common characteristic sounds as we hear in the audible range. And to a greater or lesser extent, recorded sounds are ‘interpretation’ of original source sounds even if you use ‘most accurate’ microphone.

Can you tell me about the sessions for the bat- and cicada recordings, please? I'm really interested in some of the details about what made these recordings challenging and about what it took to get the best results.

The two animal recordings on "Ultrasonic Scapes“seem to reveal a structure of some sort. After spending so much time with the subject, what's your point of view on what this structure means? Do you feel as though this is a form of communication open to human comprehension at all?

Compared to the other tracks with machine/human generated sounds, bat and cicada recordings have more organic impressions to me with rich overtones and fluctuations. If I remember correctly, I set the frequency dial from about 20 kHz to 30 kHz for cicada chorus and about 30 kHz to 60 kHz for bat calls. It was not so difficult to record their ultrasonic sounds once I found them because they usually flock one place and don’t often fly away.

But as I already mentioned, I have been more impressed by the ultrasounds in the street, which are composed of machine/human generated sounds, thus I haven‘t fully explore the animal sounds yet. Actually I once had a chance to use co-100k for recording animal sounds in the forest for a short time. I analyzed the waveform of recorded sounds but it’s not enough to understand about the structures and features of animal calls. I’d like to continue to study about the subject in the near future.

Most listeners appear to be intrigued by the concept of the album, but unsure about whether or not they would actually sit down to listen to the pieces more than once. In how far is there beauty in these pieces to you? Do you, for example, enjoy listening to the ultrasonic sounds of the Furin bells as much as to their human-range sounds?

It's difficult to answer these questions for me, but I can understand some of the tracks may not be enjoyable for people to listen to many times. As for this release, I didn't like to process the recordings into more musical tracks, even if I could do it. And for now, I'm more interested in trying to explore the possibility of unprocessed/ pure field recordings than processed ones. I think nature and environmental sounds itself has already their 'beauty' which can be easily lost by careless post processing. And I also regard my recordings as sound document of certain place and time, which can strongly evoke my memory and feelings at that moment. So I usually like to keep the recordings as-is with minimum post processing.

In his piece for Paris Transatlantic, Dan Warburton questioned the musicality of these recordings. This is something I've always been particularly intrigued by. To you, is there something truly musical, creative and individual about the bat calls and cicada choruses captured on "Ultrasonic Scapes"?

Though I often find some 'musicality' in nature and environmental sounds and listeners can listen to them anyhow, it's not my intension to present these recording as 'music'. Thus I have no idea if bat calls and cicada chorus can be truly 'musical' or not. Perhaps some people listen to them as something 'musical' and others don't. I think processed field recording work can be easily regarded as 'music'. I don't know if unprocessed field recording work can be regarded as 'music' or not. Maybe if the listener listen one as 'music', they can be 'music'. But I believe it is not just because the recording has true 'musicality' that it is worth listening to many times.

How do you define what separates music from noise for yourself – and did recording these ultrasonic sounds change something about your own perception of what constitutes music?

Bat detector did open my ear to unnoticed 'beauty' of the city and changed my perception about the environment but I don't think it changed my perception of what constitutes 'music'. Though I felt some ultrasonic sounds captured and converted by bat detector bear some resemblance to experimental music or 'noise' music I listened before, I'm not much interested in what define 'music' and what separates 'music' from 'noise'. As you know, it all depends on listeners with different musical and cultural backgrounds as well as listening situations, if a certain sound can be 'music' or 'noise'. I like to enjoy sounds as they are like small children do. I don't really care if they can be called 'music' or 'sounds' or 'noise' or whatever.