

**Two six-day workshops devoted to Max**  
**Taught by Benjamin Thigpen at Musiques et Recherches (Belgium)**  
**19 - 31 July 2022**

*“Max is the way to make your computer do things that reflect your individual ideas and dreams.”*

**I. Max for Beginners** will focus on taking the fundamental first steps with Max - the language, Midi, digital audio, synthesis, sampling, sound processing - and on building playable musical “instruments.” The goal is to become autonomous as quickly as possible. The course is open to anyone with basic computer skills; however, it is best to have some experience making music with audio software and/or hardware.

**II. Advanced Topics in Max.** Every year, the advanced course is devoted to a different topic; the idea is to offer experienced Max users the opportunity to expand their Max vocabularies, to learn new signal processing methods and to perfect their patching techniques. In the last few years, we have focused on spectral processing with FFT, on building a true phase vocoder in Max, on gen~, on MC.

**This year we will build chaotic oscillators.** Rich and fascinating, these oscillators don't just produce a tone: they “breathe”; they shift around; they seem to have a life and a will of their own. These beasts do not react in a linear way to our input; they are not fully predictable or controllable; they cannot always be tamed or domesticated. We have to interact with them and see what happens...

We will generate our first chaotic behaviors by building inter-modulating, iterative (i.e., feedback) oscillators: oscillators which modulate each other and themselves. We will then build a Duffing oscillator - based on a non-linear differential equation describing complex, chaotic and often unstable dynamical systems. After that, we will build oscillators based on classic chaos equations (Gingerbreadman map, Lorentz attractor...) and discover the sounds that they produce. Each time we build an oscillator, we will explore its potential and seek ways to control its variables so as to produce musically useful behaviors and sounds.

We will implement all the oscillators in gen~, as they cannot be realized using normal Max objects. We may also incorporate some multichannel techniques. Prior experience with gen~ and MC will of course be useful but it is not necessary. We will learn everything we need as we go.

Participants should be aware we will be diving headlong into an experimental realm. I will lead you to and toward places where I have been, but we will not always be quite sure what we will find...

**Method.** The sessions will combine lecture-demonstration-explanation with collective, hands-on, practical instrument building. We will spend a lot of time making patches together, so you should come away with a fair amount of concrete practical experience.

You will need to bring a computer with Max 8 installed, a set of headphones, and (for the beginners course) a portable Midi controller, if you have one. (There will be some headphones and controllers available for those who need them.)

Courses will probably be taught in English, but may also be taught in French, depending on the students' preferences.

**Beginners: 19 - 24 July (10 a.m. to 5:30 p.m.)**

**Advanced: 26 - 31 July (10 a.m. to 5:30 p.m.)**

**Deadlines for enrollment: 9 June**

**Maximum number of students: 10**

**Fee: 350€**

More information about the courses: [bt@benjaminthigpen.net](mailto:bt@benjaminthigpen.net)

Registration and practical information: <http://www.musiques-recherches.be/fr/agenda>  
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