

MA Commercial Music Producer

Development

ADAD7005_LON

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For this project I decided to build from scratch a software instrument in Native Instrument Kontakt. Skimming through the main platforms commonly used to create this kind of artifacts, I realized that having absolutely no experience would be a big obstacle to overcome in a short span of time and the more complex programs like Pure Data or Max DSP looked way too advanced for me. Being quite familiar with Kontakt instead, software that I regularly use because of the amount of great sounding libraries easily collectable and the extremely user-friendly interface, I started researching and learning about it and discovered the many possibilities it offers to developers.

To put it fairly simply: Kontakt is a sampler by Native Instruments; basically it allows people to create digital instruments by using audio they've recorded inside your DAW as an Instrument Plug-In. (Output.com, 2021)

Immediately after reading these lines, I thought of a project I took part in some time ago for which I had stored over 50 hours of field recorded material with the intention of one day organizing a sample library. Here was my chance to finally dip through that archive and make something out of it. All of the source material was originally collected for a documentary I co-engineered the soundtrack for, a short work about a British artist who has first discovered his passion for photography wandering around the wide empty spaces of his hometown in Jersey. The director in charge intended to approach the narration of the development of this artistic path through a documented homecoming, depicted sonically through a faithful representations of the sounds from that exact environment. The composer of the soundtrack, a London based sonic artist named Blun, decided to collect through an attentive field recording process sounds from several set locations, work I helped with as assistant engineer. What came out of those sessions was used for the composition but became only vaguely traceable back to the original sources, as the conceptual tone of the narration required very abstract soundscapes, hence heavily processing during production stages. That is why we always had the idea of using what we archived in a truest and purest fashion, building a medium more directly interrelated and that really sounded as derived from nature. One of the locations gave exceptionally musical results, an abandoned glass house originally used for cultivation, now taken over by nature and deserted for decades. The structure was severely damaged and the site was dangerous and, most likely,

prohibited but on the day of shooting, together with small pieces of ceiling coming down, a thick rain started pouring in the middle of filming and that opened up a whole new sonic world for us. The water dripping on leaves and within weeds, the wind blowing through the shattered glass panels all over, everything sounded to us incredibly evoking so we started compulsively recording, experimenting with different contact microphones and placements, also hitting surfaces with different materials. Having prepared the session attentively studying ‘*Glass*’, record by artists Ryuichi Sakamoto and Alva Noto (2016), their approach of thinking of the building as an instrument heavily inspired the way we placed together big part of the sounds, especially in the aim of inducing impressions and stimulating perceptions.

The music's drifting forms scan as ambient, but rather than imbue a sense of calm, Glass evokes an intensifying sense of unease, it evolves. [...] When Noto and Sakamoto introduce an even higher sound it evokes a physical sensation akin to freezing rain suddenly turning to ice, brittle and crystalline. (Beta, 2018)

Among the many different layers and timbres present in the collection, a series of samples recorded hitting a mallet on an outer crushed glass panel captured my attention and seemed perfect starting material for a software instrument. Captured not very closely with a Zoom H1n Portable Recorder, the samples gave clean and clearly perceivable high notes, pitched differently depending on where the hits fell but also preserving strongly the ambience surrounding, with the wind blowing irregularly and other noises from birds or trees glimpsing through the transients. I figured the natural environment would give an imperfect touch to the sounds and make them stand out from the overly digital more common devices on the market, I did not imagine at this time the complications this would implicate on later stages. At this point anyway, I organized the samples with different pitch and dynamics and started processing as little as possible, paying attention to tidy up the signals through equalization and light compression but at the same time trying not to compromise the nature of the sound source. Noise reduction processing and high pass filters covered big part of the job but also playing around with attack and release of compression stages especially came out as a very delicate process, in a thin balance between destroying the transients and making them punchy enough to be clearly perceived.

Once I was happy with what I had, which at this point was an assemblage of about 15 different samples varied in dynamic and pitch range, I looked into how many octaves I could expand my instrument to, researching the different options and understanding which would be faster and which would compromise the formants too much. As demonstrated in the lecture Creative Music Technology (Yates, 2021), Kontakt doesn't need a single sample for each key of the instrument, it automatically pitches down or up the sounds it is given, filling the empty spots in the mapping editor mechanically. As this method seemed extremely fast and easy, I tried filling up my keyboard with the files I had prepared but playing back I could not get the length right and the artifacts created by the software were too evident. I went back into the original session then and decided to manually pitch each note I needed to complete the keyboard through a series of different plugins: Ableton pitch shifter (and its several warping modes), Little Alterboy by Soundtoys and Waves Tune. At this point the most I could work with was 4 octaves but that seemed enough for the type of instrument I was coming up with.

After fine-tuning every single note I needed and editing length and peaks, I proceeded to the tedious stage of exporting singularly every file and labeling it diligently. Using David Hilowitz's tutorial on mapping the editor (2018), I learned that using an older version of Kontakt could be a big advantage in terms of availability for commercial purposes, as the instruments built with the latest instance of the software (Kontakt 6) do not work on older versions.

Some independents may still opt to continue authoring in earlier versions, since instruments created in K6 are not backwards compatible, nor usable in the K6 Player. (Magnus, 2019)

Having recently tried to download some sample libraries from external developers, in the specific The Freedbacker by Majetone, I encountered this limitation myself and it turned out to be very frustrating as a consumer. Moreover the new features added to the editor were not worth such boundaries on the marketplace so I just went with the older version for the time being.

Something else that I realized from the same tutorial was that I had only worked on one sample per key and that wasn't even close enough to build a playable instrument.

I went back to Yates and researched thoroughly what he mentions about Round Robins.

Round-robin functionality is offered by most samplers and employed by many ROMplers to authentically mimic the sounds of real-life instruments such as drums, guitar and bass. It enables us to assign two or more samples to a single key before playing them back either sequentially or in random order. By capturing several 'takes' of the same sound (snare drum hits, string plucks, etc) then triggering them via round-robin sampling, it's possible to avoid the repetitive, 'inhuman' sound of the same sample being used over and over again. (Computer music, 2015)

Back to the session after my first setback, I had to work on the processing to create variations for each sound, tweaking compression and eq mostly, but also affecting the pitched samples, setting different decay and sustain parameters each time.

I came out with 4 different groups of files and I thought I finally had enough variation to proceed to the fun stages; I soon discovered that I was wrong twice: I still missed quite a lot of material (but I would find that out only much later down the line) and the next step was not going to be fun at all, actually it would turn out to be the most tedious and nerve wracking stage of this production. The mapping editing took me several hours as Kontakt mechanism for importing samples, even if easy and straightforward on first sight, revealed many little fragilities to an unfamiliar developer like I was. First of all, the selection is done manually and since in this case we are talking about 4 octaves, it meant highlighting one by one 48 files, times 4 when distributed over different groups to set up the round robins. But that is only if one is already aware of the 'selected groups only' button [Appendix A], which needs necessarily to be highlighted to avoid importing the same files into all groups each time. Obviously, worried about dragging the right files, I only discovered this function when it was too late, so had to restart the whole process a few times around to get everything in the right place.

Once done anyway, my instrument finally played and the sound was not too bad after all. Very basic but the excitement of having a functioning tool still took over at this point, so next I wanted it to be inviting and good looking. That's why I started thinking about design and graphics.

Being very simple and focused on an unpretentious concept, I wanted a design that represented the sound source and immediately pictured the environment the sonic material comes from. I went back to my archive of photos from the day of shooting and selected a few options but in the end a particularly blank picture seemed to perfectly describe the whole concept: it had the glass element, the wild of untamed nature and the white sky of Jersey, indicating overall a vacuity that perfectly suits the naivety of the instrument.

Vaguely taking inspiration from The Maverick, library by Native Instrument that I regularly use and consider among the best MIDI instruments I ever came across, I approached the font choice with the same ideas: simplicity, directness and modesty; I also opted for Italics to make it look more elegant. What I tried to achieve here was an original design, different from any libraries I had seen, with a peculiar graphic, feature that I greatly admired in Majetone products. Their unique wallpapers in fact, even if hand-made and relatively humble, immediately characterize the whole line and constitute a distinctive trait that links together every set of sounds [Appendix B]. Just looking and studying this developer, an idea started to take shape: I could build several plugins in the same style from the original archive I had collected, each covering a different set of sounds but all looking similar and taking from the same sonic universe. At this stage anyway it was definitely too early to plan more productions, since this first prototype was still far from being complete and ready to run.

I started researching more to understand what features I could apply to the instrument to make it more customizable and to offer options to users and while swimming through the many tutorials on YouTube, platform that throughout offered me the most help with its the enormous amount of resources and visual and very pragmatic material available, I came across content creator Andrew Southworth, who talks about the advantages of having different samples triggered depending on the velocity of the MIDI signal and how such a simple (but very time consuming to develop) feature would make an outstanding difference in how the instrument feels when played by users (2018).

At this point I had to evaluate whether or not my project needed this extra level of details and despite I initially thought that a simple device as this was coming to be did not necessarily require absolute fidelity as it did not aim to emulate an object of the

material world, in my experience as a producer the playability and the response are the characteristics that make virtual instruments worth playing.

Sampling technology has become so widespread that it is no longer considered remarkable. Indeed, in many ways, it has become 'invisible' — so widely accepted and taken for granted that no one notices it any more. (Howell, 2005)

I embarked then into a very practical research among my favorite Kontakt instruments, loading them up and checking their mapping and I found out that my most used electric pianos were mapped entirely differently between each other, even if from the same developer and belonging to the same pack, an official Native Instrument Factory Library. The Mark (a Rhodes emulation) had only one sample for any velocity from 1 to 127, while the Wurly (reproduction of the famous Wurlitzer piano) had 6 different samples triggered for various intervals of velocities. [Appendix C]. I decided to go somewhere in between and with the kind of field recording I had, I obtained 3 different dynamic ranges in the end. I then started mapping them in but knowing the issues I had already encountered before, I managed to go through the whole process way less painfully this time. It still took me a good full hour but the trial and errors of the first time definitely allowed me to avoid silly mistakes and having to restart several times was not necessary now.

Vitrum, that's the name I had chosen for this artifact by this point, was finally fully equipped with samples and a main graphic, so I started digging into the possibilities opened up by effects. Kontakt interface allows recalling many instances of effects fairly quickly, going down through the building blocks of the signal [Appendix D].

At the group level of an Instrument you can control the Source, Group Insert FX and Send Levels, Amplifier module and the Group Insert FX and Send Levels. As an Instrument can have many groups, each group can have independent settings from one another. (adsrsound.com, 2021)

So the options given to developers are truly immeasurable but I was immediately sure that the simplicity of the instrument should absolutely not get lost into endless parameters and infinite choices to be made. Recalling another of my favorite libraries, the Newmello by Wavesfactory [Appendix E], I wanted an instrument with serious

limitations, something that sounded instantaneously unique and could not confuse the user into a labyrinth of knobs and faders, again, less is more is what I thought. I started playing around with a few effects and since each one of them had several parameters to maneuver, I had the idea of only setting up in the user interface one knob for each effect: I would personally fix most settings and give one parameter to control so that the instrument would feel expandable but still simple and easy to use. Analog feel remained my main focus so I chose to add to the chain saturation, with a control on dry/wet, a low-pass filter, with control on frequency cut and the lo-fi: a bit crusher with sample rate fixed but the possibility of adding noise; last but not least, a convolution reverb in send where decay and pre-delay are set and the user can only decide how much signal to feed into the aux channel.

Once all this was predefined, I had to finally face what seemed to me like the ultimate challenge, the scariest bit: coding.

Having never gotten into computer language and learning that Kontakt had its own scripting worried me into thinking that my instrument had reached its potential and I could not go much further than this. I was wrong again but this time pleasantly so. I fell into the rabbit hole of YouTube tutorials once more and copying bits of code here and there, looking up continuously the official KSP Reference Manual (Jeroma, Hanley, 2015) and reading several threads on dedicated forums, I managed not only to add controls connected to effects, but also to discover the possibility of adding custom designed knobs. As suggested by Hillowitz (2019), I downloaded the Japanese software 'JKnobMan' to easily customize my design and I realized a few sketches that suited the main design [Appendix F], trying to suggest glass handles through overlapping more transparent layers; once happy with it I learned that Kontakt identifies customizable knobs not as knobs but as sliders, so once again I had to restart from scratch and re-interpret my coding, adapting a few features, like for example inverting the direction in which the mouse drags to move the knob up and down, the names shown underneath each parameters, etc. Understanding the mechanism though, even if frustrating at first and very frustrating when occasional computing mistakes were made, turned out to be quite fun and revealing, making me understand the logic behind many functions and giving me a glimpse on a whole new world.

Once my coding was all done and all the elements placed in the user interface, I added a last knob for the master volume as I always found the main control of Kontakt a

little hidden and not reachable easily enough for some reason. Lastly, I added customized labels to the parameters thinking of one of the funniest looking libraries I have seen on the market during my researches, Arcane by Embertone, with an interface where indications about what the commands do are far from clear but the experience of using them becomes amusing and engaging [Appendix G]. I called ‘Sharpness’ the saturation knob, alluding at the broken glass, ‘Dirt’ the noise parameter, ‘Cloudiness’ the filter and ‘Reflections’ implicating reverb.

Now I was finally done. [Appendix H]

I tried adding the instrument to the side panel dedicated to libraries but I found out that only developers officially authorized by Native Instrument have this option, as it involves buying a license (Murray, 2018). So I binned the idea for the time being, as Vitrum is at the moment only a prototype but the possibility of investing into this feature for future commercial possible purposes remains an idea to keep in mind. For beta testing I collected all of the necessary files in a tidy and neat folder, making the whole look as professional and ready for download and use as possible, also adding a file in pdf with info and basic instructions, as for other famous products of this kind, like for example the excellent piano sampler Noire by Native Instrument [Appendix I] built in collaboration with Nils Frahm.

The different feedbacks I collected were pretty much all on the same lines: the users found the instrument relatively basic and the main problem for every tester was the strong background noise. The wind inside the original source material remains in fact a big portion of the sonic texture of the samples and even if a nice note on a conceptual level in my perspective, apparently makes Vitrum very noisy and not clear enough for being used in an average commercial production. One of the parameters especially, the ‘Dirt’ button, makes the piano samples even less intelligible when activated. From these first interactions with users seems clear, or even clearer than before, that a line of instruments of this sort is mainly destined to sound designing purposes and maybe experimental composers, commonly less afraid of implementing unusual sounds into their productions, while more traditional oriented commercial pop producers might find the textures and parameters ‘too lefty’. This could definitely be an important piece of information in a potential marketing study to pinpoint a consumer pool and direct possible advertising campaigns, as any producers can easily notice nowadays swiping through certain YouTube videos instead of others. I’m

thinking of the plugin 'Drip', for example, for which an advert comes up each time a breakdown video for a hip-hop track gets opened.

The graphic, on the other side, appeared to the beta testers efficient and reflective of the virtual instrument and that also inspires several options for other potential devices, with a full archive of pictures from set location theoretically waiting to be utilized for new other devices.

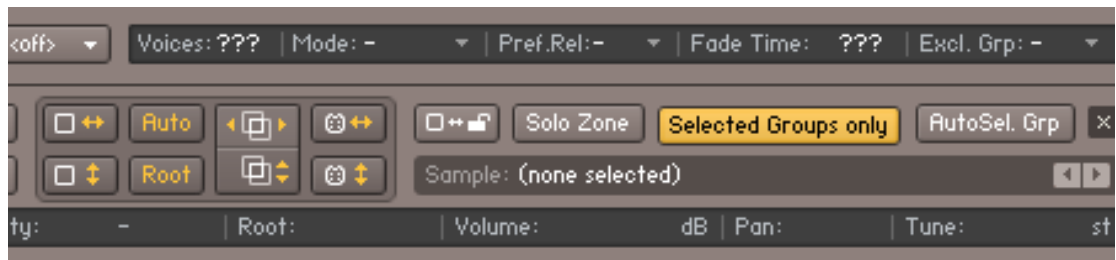
Compared to a commercial release, Vitrum seems to have a good developing potential but still aspires to be a simple and user-friendly virtual instrument. Not necessarily designed to be utilized by industry professionals; potentially an interesting tool for a less experienced type of user, perhaps someone looking for a unique timbre and/or affordable variants to stock piano sounds.

The 4 octaves capacity, the dynamic response to various velocities and the few parameters chained together make of Vitrum a reactive playable tool, even if still limited to 5 samples playing at the same time because of the confusion created otherwise, choice that limits the possibilities of the instrument but aims to preserve clarity and definition.

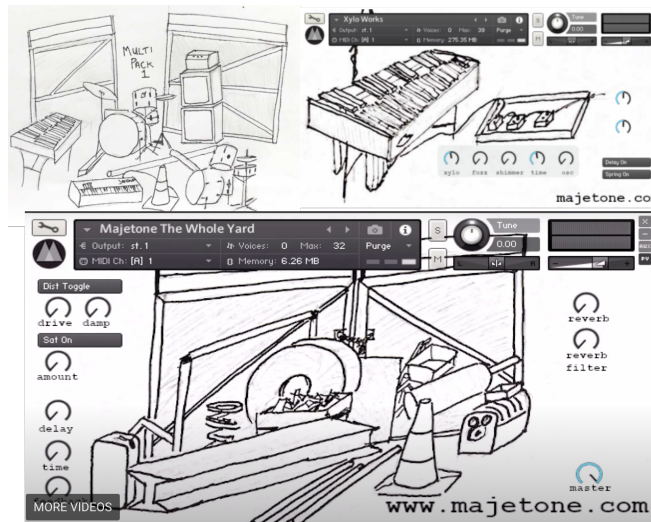
In conclusion, several improvements could be made, most of them regarding the processes of sample collection first and the post-production processing after. Not enormous financial openings but still an interesting perspective if developed with other further instances. The enormous amount of collected material definitely suggests an expansion, perhaps a line of several simple tools on the example of plugins like Wavesfactory Music Box, a 'collection of sounds from a beautiful sounding old music box for Kontakt' (wavesfactory.com, 2021), given away for free in exchange of a subscription to the newsletter.

I definitely enjoyed the process of creating Vitrum and even if very frustrating and time consuming, the trials and errors made me learn and understand fairly quickly how to bring some concepts to life and it certainly inspired many creative ideas, both sonic and visual. Next time it will be definitely much easier.

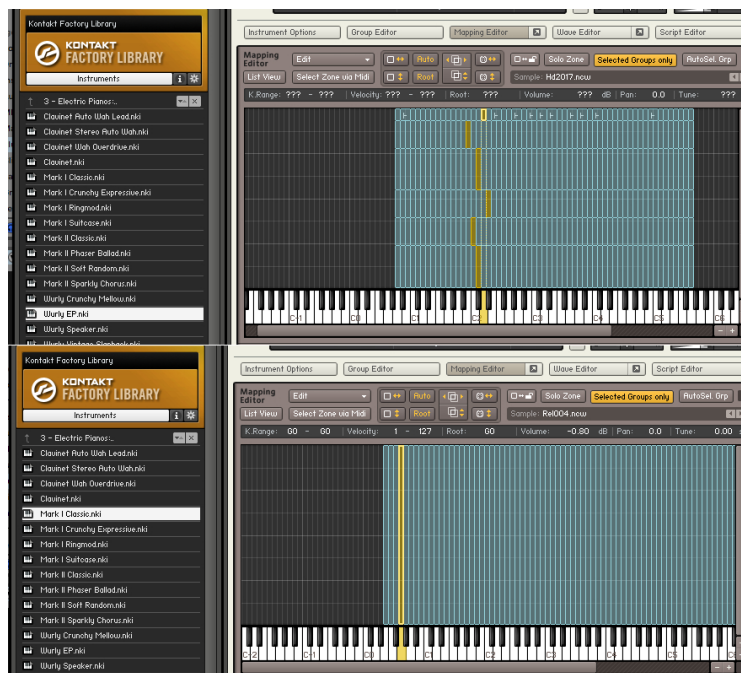
Appendix



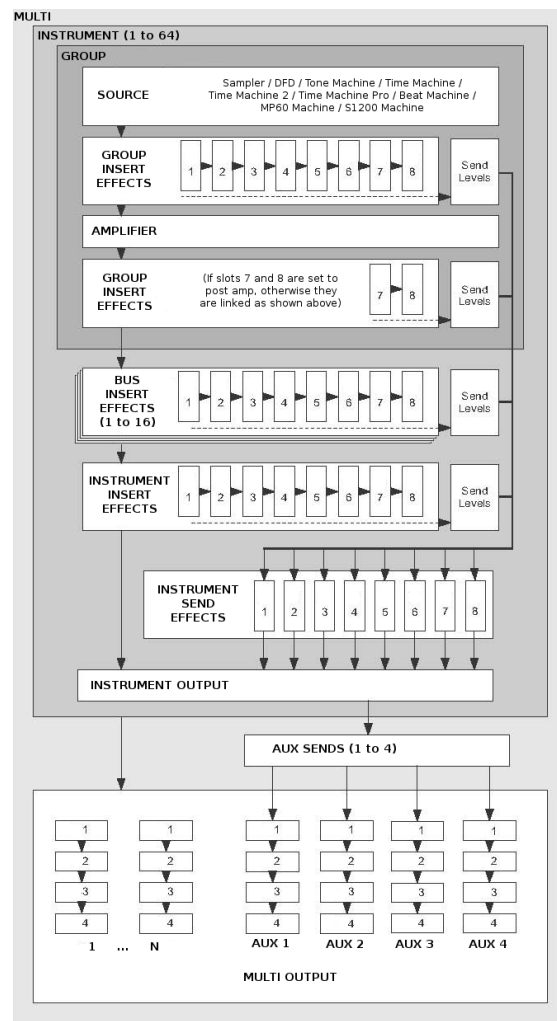
Appendix A: Selected group only button



Appendix B: interconnected design in various Majetone instrument productions



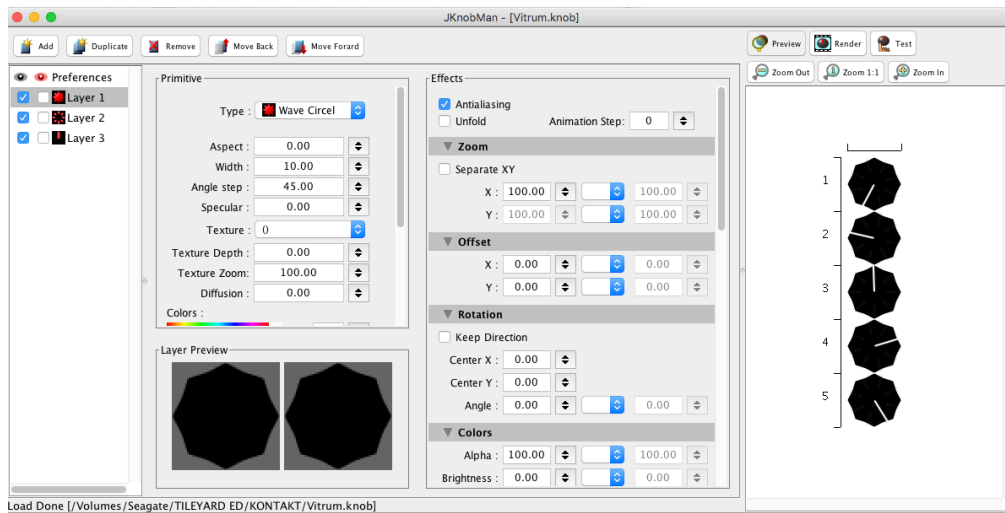
Appendix C: different velocity mapping settings for NI Factory library instruments



Appendix D: block chain in Kontakt signal flow



Appendix E: Newmello by Wavesfactory and its simple interface



Appendix F: JKnobMan and knob design stages



Appendix G: Arcane by Embertone and its mysterious interface and controls



Appendix H: Vitrum completed interface

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1. WELCOME TO NOIRE		
Thank you for purchasing NOIRE. This document provides information about the library and a description of all of its functions. We hope that you enjoy using NOIRE.		
1.1. About NOIRE		
NOIRE is a virtual instrument that replicates a unique Yamaha CFX grand piano, belonging to the composer and pianist Nils Frahm, who personally handpicked the instrument in the Yamaha German headquarters in Hamburg.		
To produce the NOIRE Library, this piano was sampled by Uli Baronowsky from Galaxy Instruments. It was recorded using rare, vintage microphones and preamps in Frahm's recording studio at the legendary Saal 3 of the Funkhaus Nalepastrasse, Berlin.		
Baronowsky and Frahm have already contributed the critically acclaimed UNA CORDA Library. UNA CORDA was based on the recording of an upright piano and was characterized by its intimate feeling and nuanced sound. NOIRE presents a variation of this intimate concept, using the huge sound of a grand piano.		
As with UNA CORDA, Nils Frahm greatly contributed to the sound design of NOIRE, and provided input on how the strings could be prepared to achieve his distinctive intimate and emotional sound. In addition, he greatly influenced the sound by sharing his grand piano recording techniques and setup.		
While you can use it for a wide range of styles, the NOIRE Library has been specially designed for the 'neo-classical' or 'post-minimalistic' genre, represented by musicians like Nils Frahm, Max Richter, Agnes Obel or Ólafur Arnalds.		
1.2. NOIRE's Special Sound		
A number of sound design elements support the emotional and expressive tone of the NOIRE instrument:		
To match the style of performances and recordings of Nils Frahm and similar artists, NOIRE features fully controllable hiss. Noises created by both the piano and the piano player, for example, noises the pianist makes when moving or breathing, are also included. Mechanical noises created by the piano were also recorded, which contributes to the intimacy and character of the sound. In NOIRE, you can add and adjust these noises as desired.		
Due to the close microphone position, all the subtle mechanical noises are audible while remaining fully adjustable. You can use these noises to create a realistic sounding piano performance or use them for creative effect. The noises can also serve as a rhythmic element, especially when used within the particles engine. In NOIRE, fabric and mechanical noises are adjustable, in order to create different sounds and rhythmic effects.		
Atmospheric and ambient sounds can be created by utilizing the builtin effects in the Style section. To modify the basic sound of NOIRE, you can add lo-fi effects such as tape saturation and filtering, as well as convolution-based effects and modulation. For a final touch, shape the sound by applying equalization and compression.		
1		

Appendix I: Documentation and instructions for Noire by Native Instrument

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