MUTANT

Multiperspective Music

Masterthesis Multimedia Design

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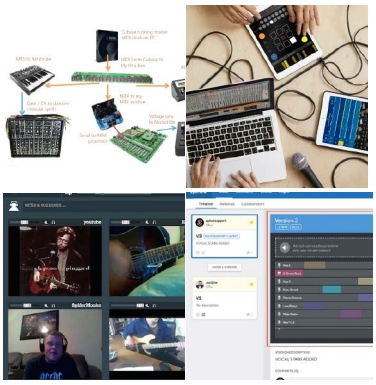
Starting point

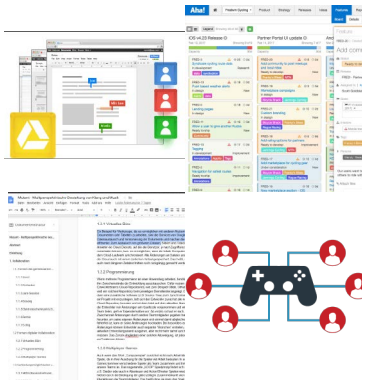
Various collaborative apps allow users to work online simultaneously on a document, code or track. Beside new tools that create compositions in conjunction with artificial intelligence, established digital interfaces are synchronizing devices and electronic instruments through collaborative data exchange. The project explores what happens if two or more users create a piece of music together by listening to it at different speeds and in different keys. On this basis, various experiments were carried out to investigate the interaction and behaviour of several collaborating users, as well as searching for solutions and parameters to represent music in a multi-perspective approach.

Methods of collaboration

Types of collaboration in acoustic and electronic music



Connection between devices and applications for musical synchronization

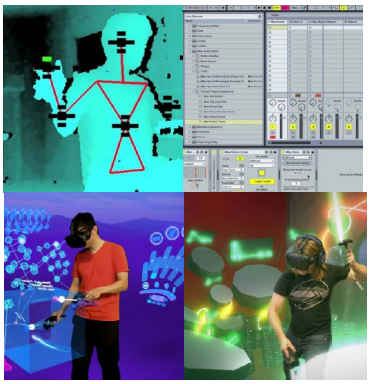


Collaborative workflows in documents, coding and multiplayer games

Digital music interfaces

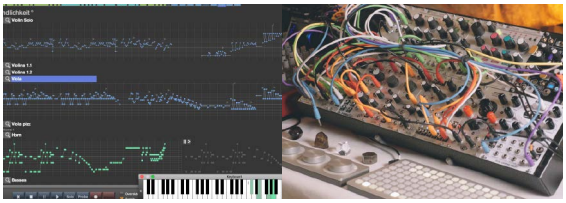
Interaction with classic music user interfaces

Touch interfaces and hybrid interaction devices

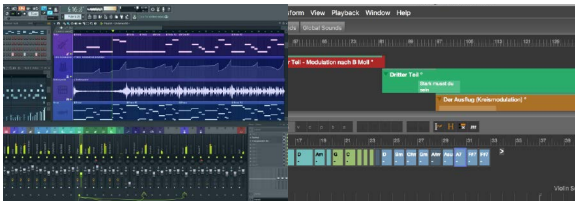


Motion tracking based sound control and VR-music apps

Approaches in digital music production



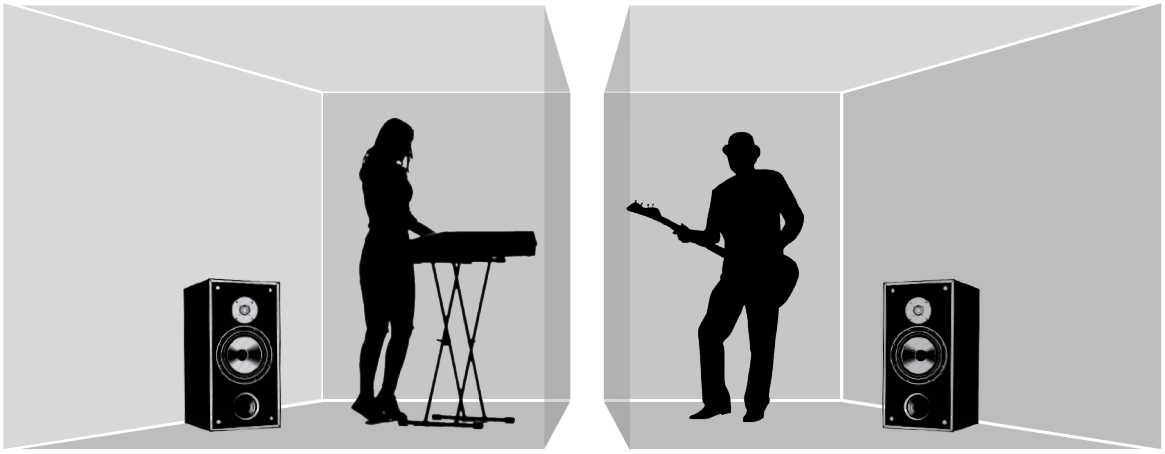
Music composition and experimental sound design



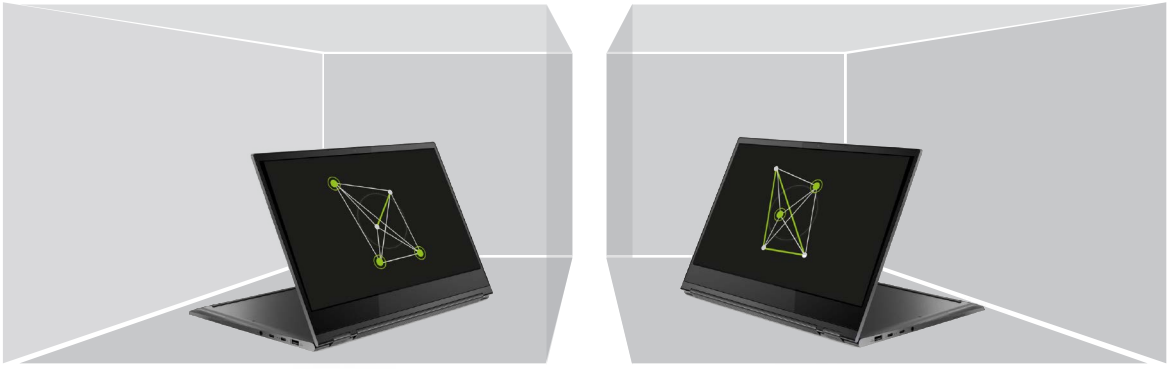
Segmentation through tracks and time sections

Multiperspective Music

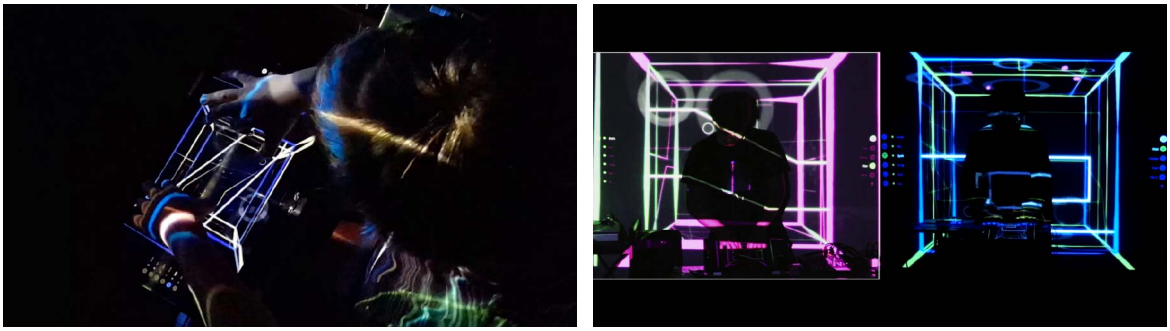
Mutant‘s first prototype is a multiplayer application that enables users to create sound and music together. The app focus is the tesseract - a four-dimensional geometric shape, that serves as a metaphor for multiperspectivity. Its eight cells stand for eight different perspectives on the same piece of music, which differ in key and speed. The players can freely switch between these cells via a navigation system. In this way, people can interact in different cells and accordingly from different perspectives.



Example for studio situations: Two musicians playing together in different rooms by listening to themselves over speakers



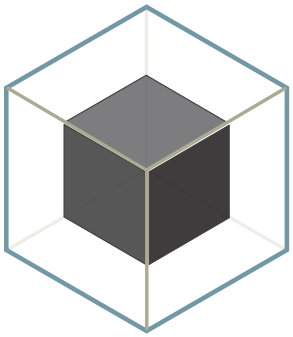
Application concept for Mutant: Digital collaboration via local WIFI in separate rooms



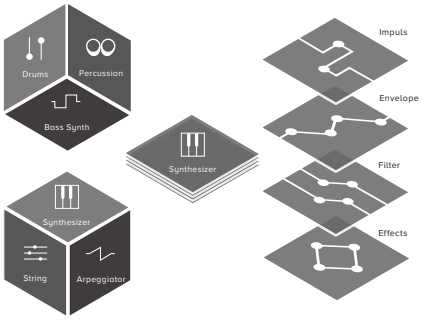
First prototype of the application: Mutant multiplayer testings at Ectoplastic Lab, Halle 2019

Instruments and Controllers

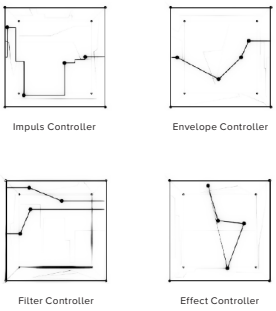
The central cube of the tesseract has six surfaces. Each surface comprises one instrument: synthesizer, strings, bass, arpeggiator, drums and percussion. Every instrument include four control layers. These are used to record tones, to change their dynamics, to deform the sound and add diverse effects.



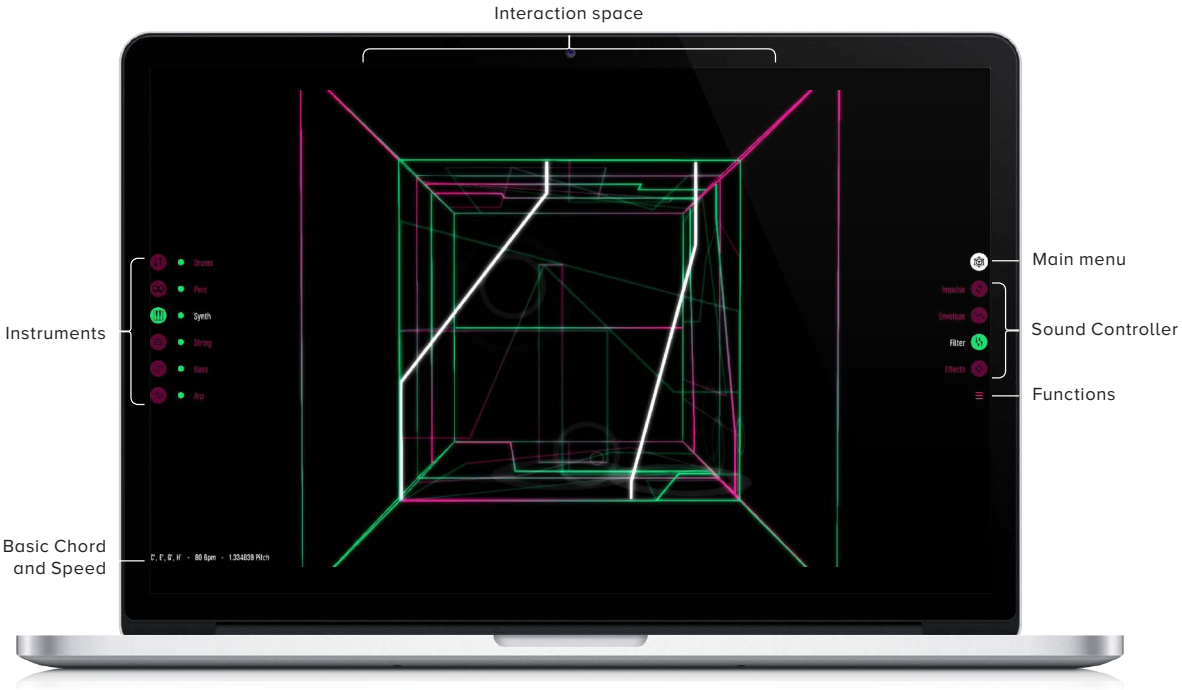
Center cube of the tesseract



Instrument surfaces and controller layers



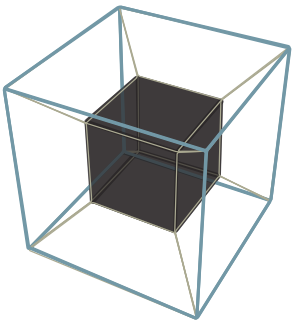
Sound controller



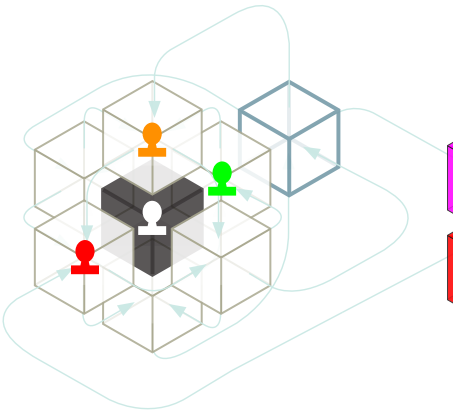
User interface of Mutant: interaction area, instrument selection and sound controllers

Navigation inside of the tesseract

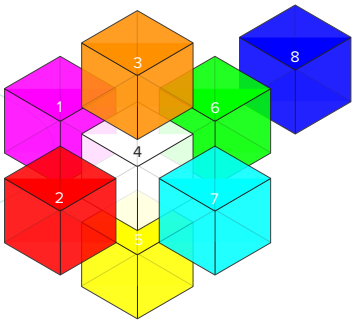
Each of the eight Tesseract cells has its own specifications in the way how the instruments sound and in which tonal environment the piece of music takes place. The navigation system allows players to enter other cells by rotating the tesseract. According to defined parameters of the cell, the basic tones and tempo will change and reproduce the same recorded notes and values with different characteristics. The recorded melodies and rhythms can thus be heard and developed from different musical and tonal perspectives.



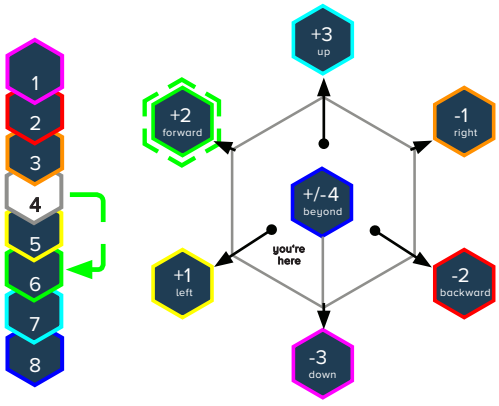
Parallel projection of the tesseract



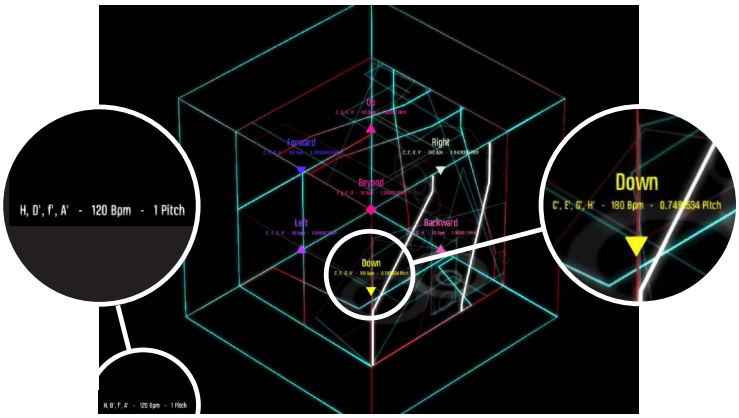
Players in different cells of the tesseract



Each cell has its own basic chord and playback speed



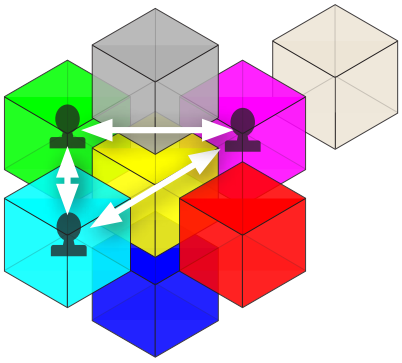
Listing of the eight tesseract cells; Directional scheme of the navigation system



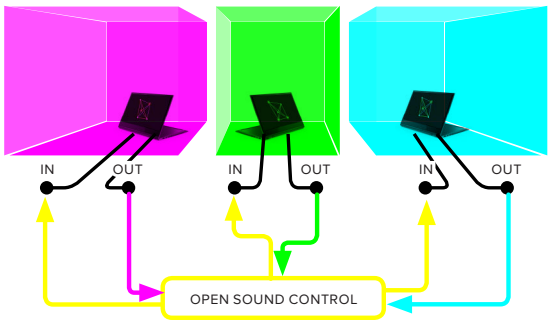
Information about the current cell and the other cells, that are reachable over the navigation buttons

Loop-Recording and Data-synchronization

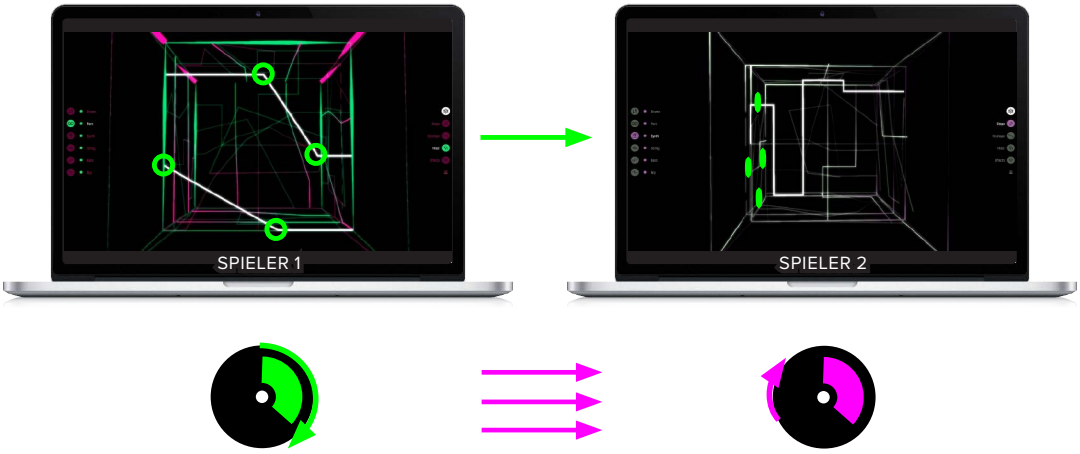
Similar to musicians who work with loop machines, all touch interactions are recorded and played back via loop recording. The devices, which are connected via a local network, exchange the recorded data as data loops. Each loop has a fixed clock length and resolution and can be written and played back at different speeds. Data exchange via OSC (Open Sound Control) takes place in two separate steps: In the first step, the interaction of the respective participant on the other device is moment only visualized for the time being. In the second step - after completion of the interaction - the recorded data will be transmitted. Afterwards - and only then - the other players can hear the changes. The subdivision of the data exchange into these two steps ensures clock-synchronous playback of the recorded melodies and rhythms at different speeds.



Data synchronization between the player‘s devices



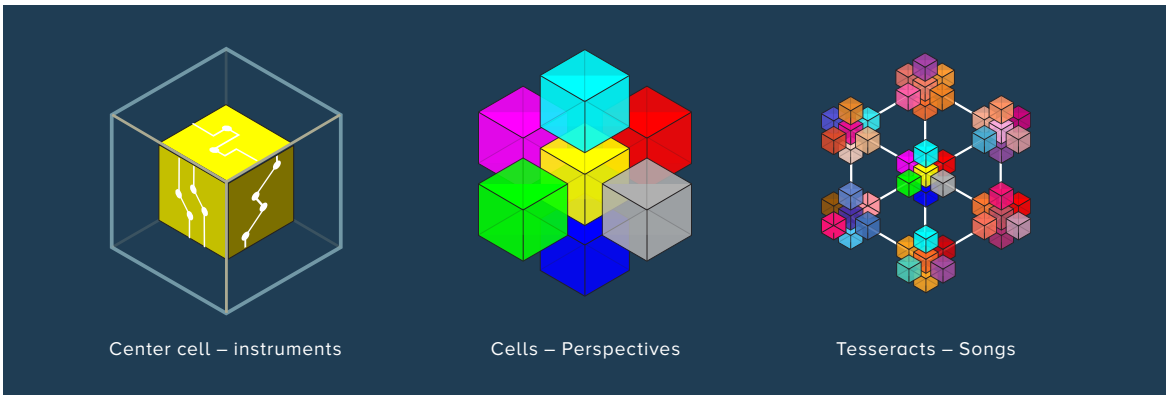
Data exchange through OSC (Open Sound Control)



Data-synchronization in two steps: 1. Information about the interaction of players; 2. Exchange of recorded data with the end of interaction

Experimental prototype and interactive music album

Mutant offers individual composition to be experienced from several musical perspectives and in different sound landscapes. The stylistic figure „Tesseract“ and the cross-cell instrumentation give the possibility to listen to intuitively recorded loops directly in various keys and speeds. The creative process of Mutant led to different versions of the tesseract, which can be selected by the listener within the application similar to songs on a CD. In this sense, Mutant resembles an interactive music album in which each song has its own instrumentation, mood and dynamics. It becomes audible through inputs and interactions and can be interpreted individually or together.

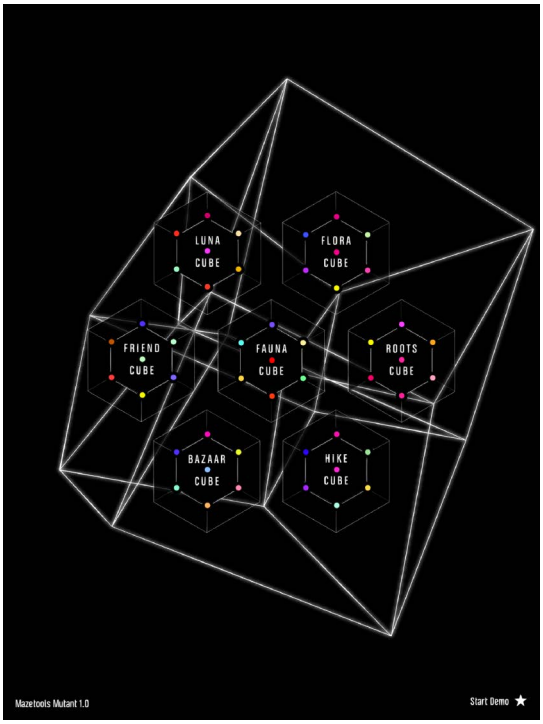


Elementary parts of the application connected to the tesseract

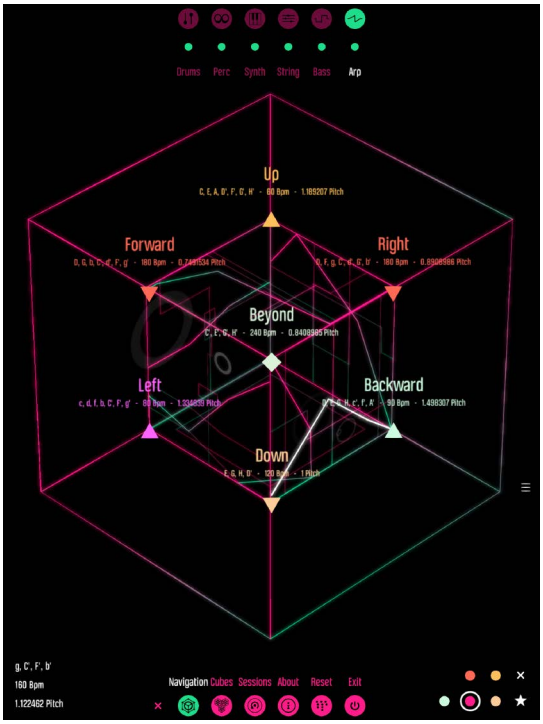
Selection menu for choosing the tesseract / song

Further development

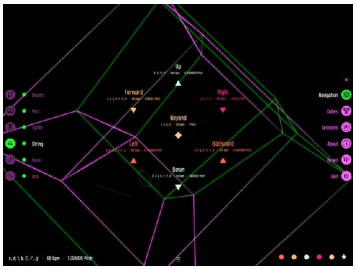
In order to finalize the application, many technical and design improvements and changes have been made, and an international beta testing has been started. In addition, the app was equipped with a virtual reality mode in which the user is located in the center of the cube. The further development and user testing of the VR version is scheduled for 2020.



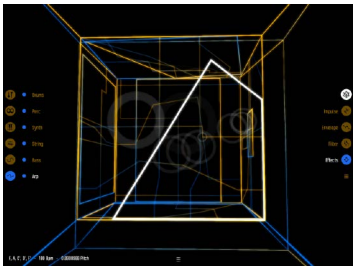
Startup screen of the App on iPad



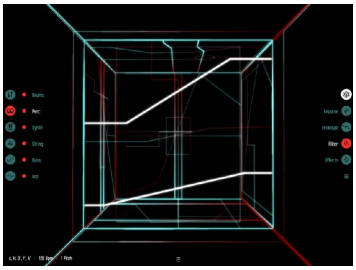
Navigation screen with extended functionality



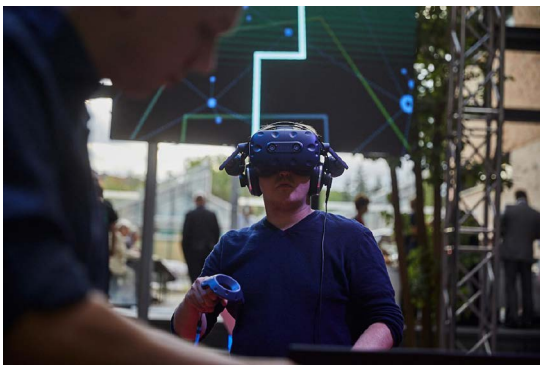
Rotation of the tesseract



Multitouch interaction layer



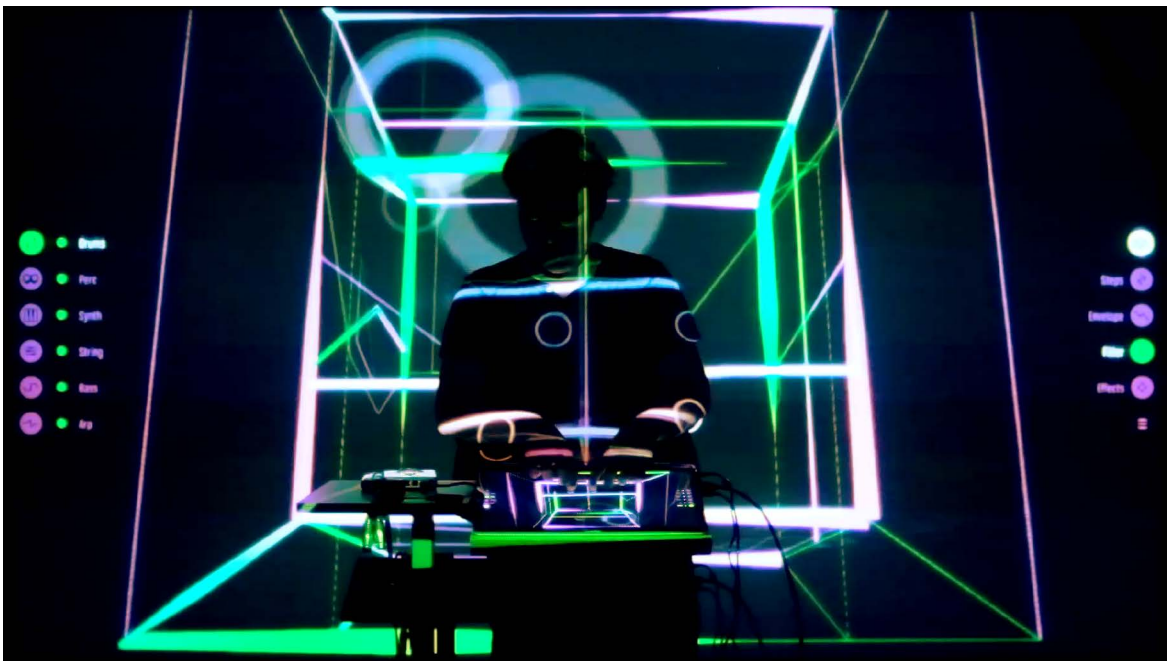
Touch input through 1 - 4 fingers



Live-performance at TGZ Halle using Mutant VR (Jakob Gruhl and Stephan Kloß)

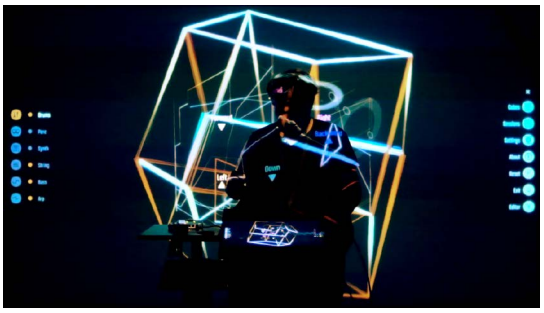
Multiperspective Collaboration between both version: Multitouch- and Virtual Reality

Video Links



Mutant Trailer Video

https://www.youtube.com/watch?v=nOZIo1c0J1M



MUTANT @EctoplasticLab 22th June 2019

https://www.youtube.com/watch?v=3mZ8xAug1Bk

MUTANT @EctoplasticLab 20th June 2019

https://www.youtube.com/watch?v=4jaJcw7k5cA

Picturesources

Playground App
https://ipadmusiced.files.wordpress.com/2015/07/playground-screen.png

TC-Performer
https://i.vimeocdn.com/video/521321130_1280x720.jpg

TC-11
https://i.ytimg.com/vi/_zrnAJq8j-U/maxresdefault.jpg

Gestrument
https://i.ytimg.com/vi/ixNrcpGCdKg/maxresdefault.jpg

Ableton Link - Lokale Kollaboration
https://cdn-resources.ableton.com/80bA26cPQ1hEJDFjpUKntxfqdmG3ZykO/static/images/og-images/link.d3051ca67707.jpg

Google Drive
http://learning21st.com/wp-content/uploads/google-drive2.jpg

Gitlab
https://wwwcdn.aha.io/assets/aha-send-to-gitlab.cbfea463136a05c87c521d1dbfa748fb.png

Multiplayer Games
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Touch
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iOS Musician
https://dt7v1i9vyp3mf.cloudfront.net/styles/news_large/s3/imagelibrary/o/oi2a2353-edit-860_XnulNVr_lxG0Q0Bn_qsHI7_wOXEf.jpg

DAW - Klassisches Userinterface - FLStudio
https://cdn.mos.cms.futurecdn.net/44pgRWyrVcWgxexraFq3am.jpg^

KORG KAOSS PAD
https://www.bonedo.de/fileadmin/_processed_/a/0/csm_kaosspad3_feature_IMG_7642_d5bec74799.jpg

Reacttable
https://upload.wikimedia.org/wikipedia/commons/thumb/e/e3/Reactable_Multitouch.jpg/1200px-Reactable_Multitouch.jpg

Roli Seaboard
https://i.ytimg.com/vi/6SCug5kUsBs/maxresdefault.jpg

Max4Live - Kinect Modules
https://i.ytimg.com/vi/k-ZLZ9GLLNw/maxresdefault.jpg

Lyra VR
https://steamcdn-a.akamaihd.net/steam/apps/572630/

Soundstage
https://i.ytimg.com/vi/uYYPG4RQ63w/maxresdefault.jpg
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Klimper App
https://pbs.twimg.com/media/DGaDlp1XsAUCSQh.png

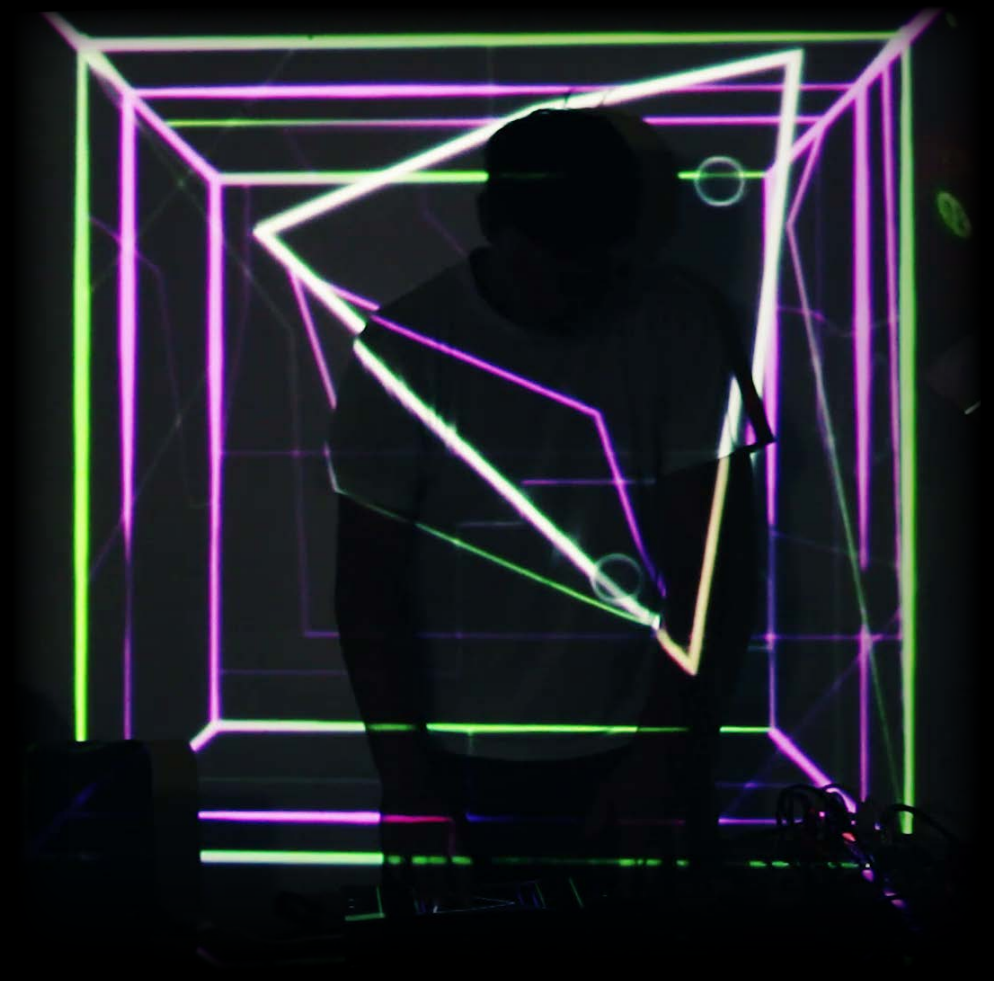
Endel App
https://www.lead-digital.de/assets/photos/_size_720/Endel-Modi.jpg

Komposition: Synfire
http://www.cognitone.com/products/mps/images/mps-main-shot.png

Eurorack
https://i.ytimg.com/vi/3EmdTe0A9es/maxresdefault.jpg

Segmentierung durch Spuren
https://www.chip.de/ii/3/0/1/3/8/6/5/3/41243a42c39c61d6.jpg

https://www.logitheque.com/media/files/data/logitheque01/MAO%20Softwares/fl%20studio.png



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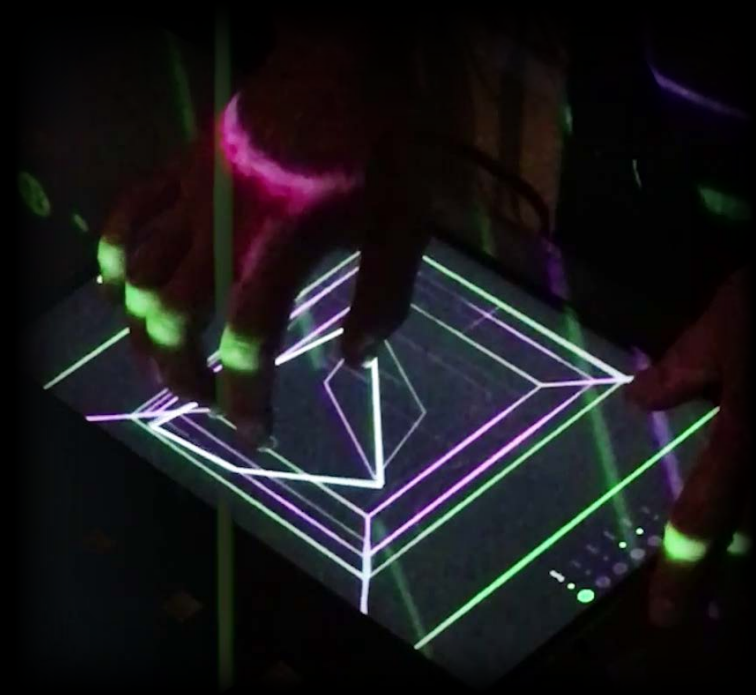

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