

# VR-mony

A platonic solid love experience

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## Advanced Coding Tools and Methodologies

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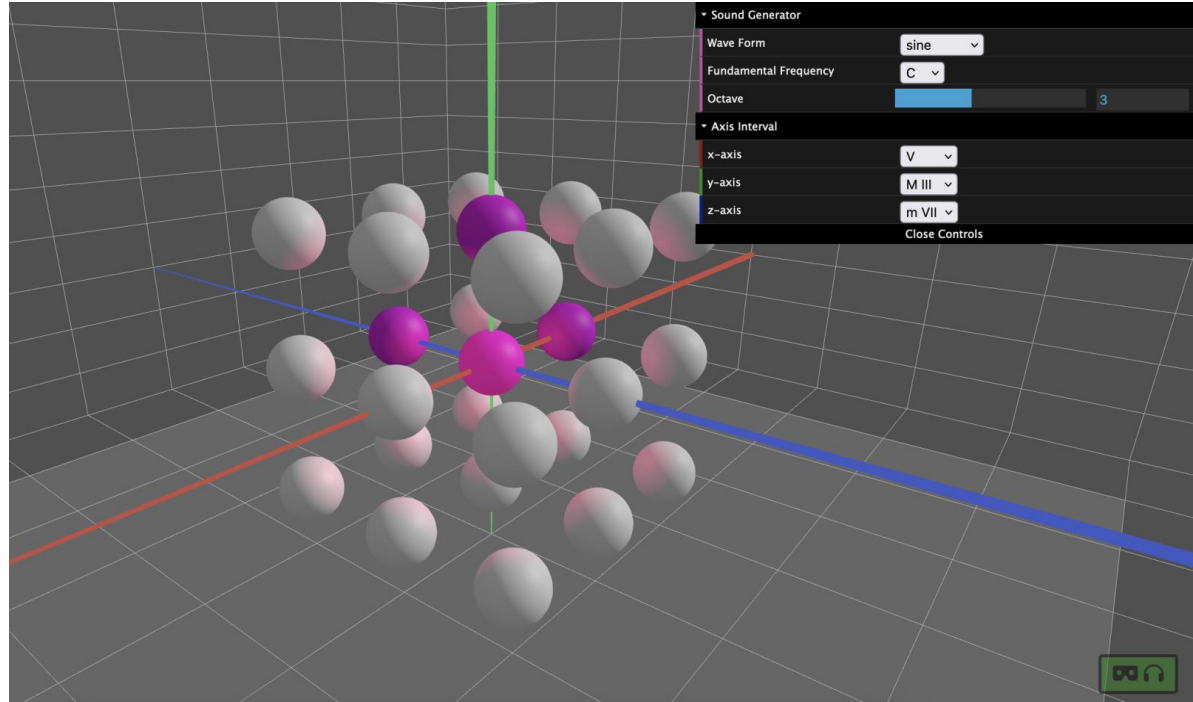


**POLITECNICO**  
MILANO 1863

# VR-mony

What VR-mony is:

- VR-based web application
- Multi-user interface
- Realistic 3D spatializations



*" Perceiving is a way of acting.  
Perception is not something that happens to us, or in us.  
It is something we do. "*

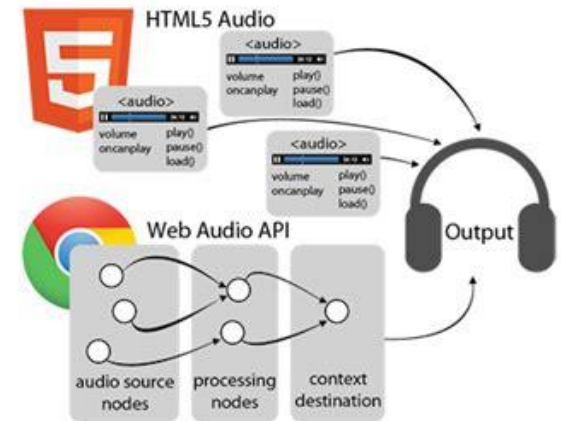
*Alva Noe - Action in perception*

# An overview of the project

**VR-mony** is developed with *HTML*, *CSS* and *Javascript*

Application Programming Interfaces (**API**):

- Web Audio API
- THREE.js
- Web XR API



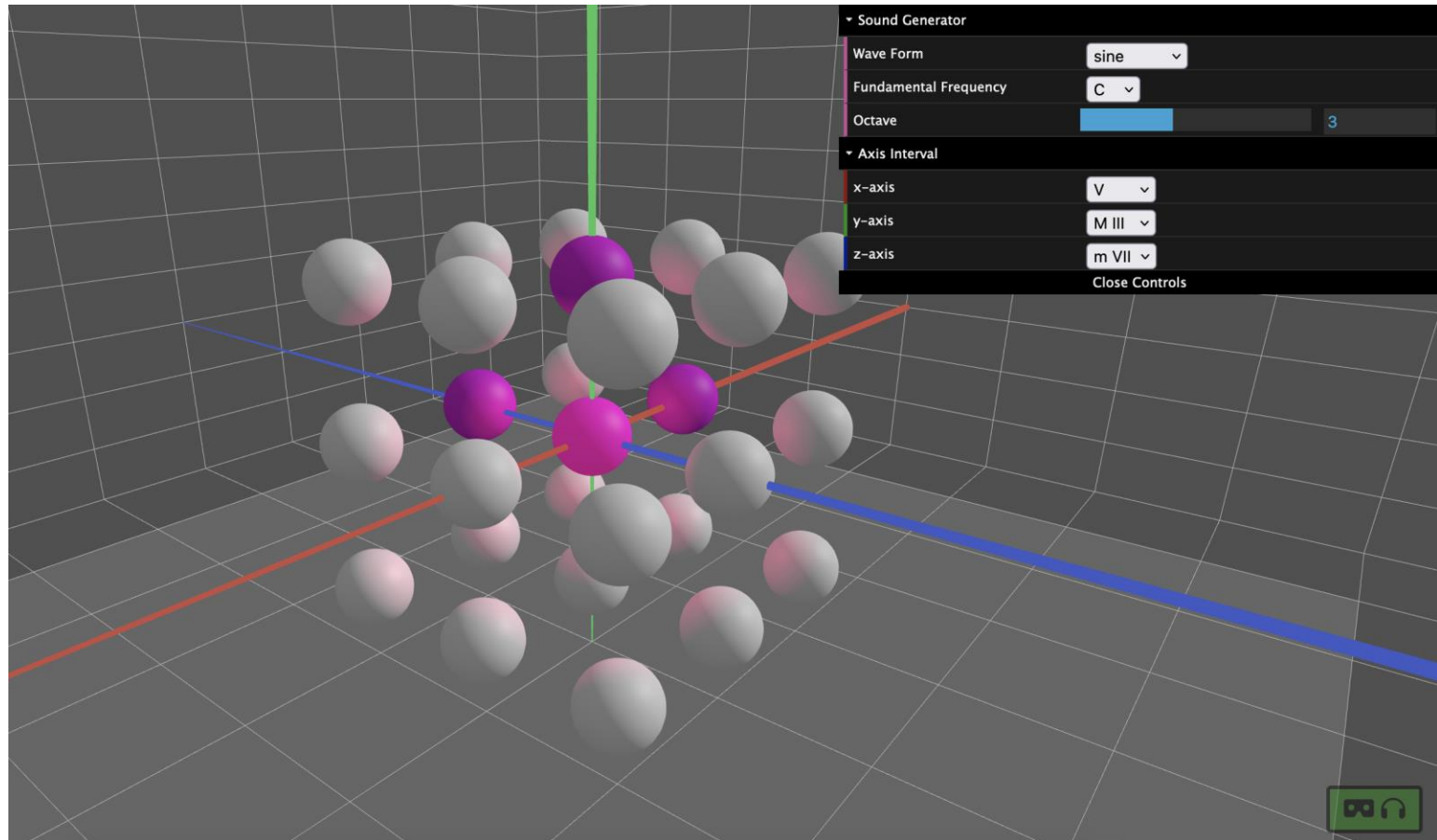
Multi-user Interaction based on Firebase

# Homepage. The Book



The homepage is just a joke. Interacting with the book you enter into the VR experience.

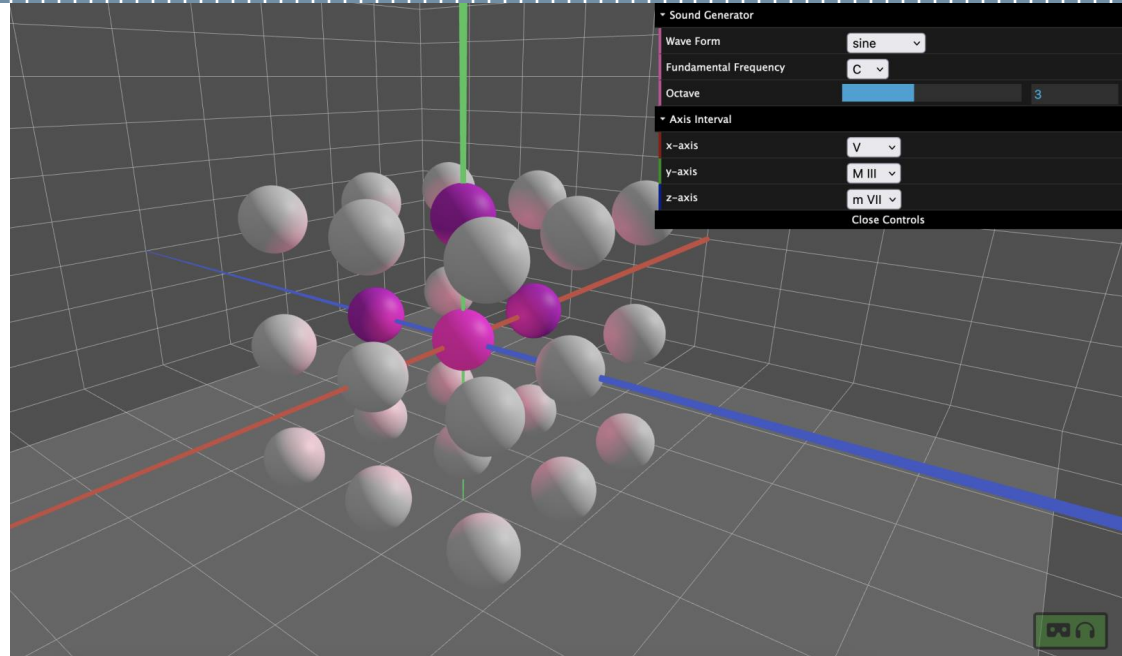
# The Lattice



# The Lattice

A cubic **lattice** of 3x3x3 spheres is the core of *VR-mony*.

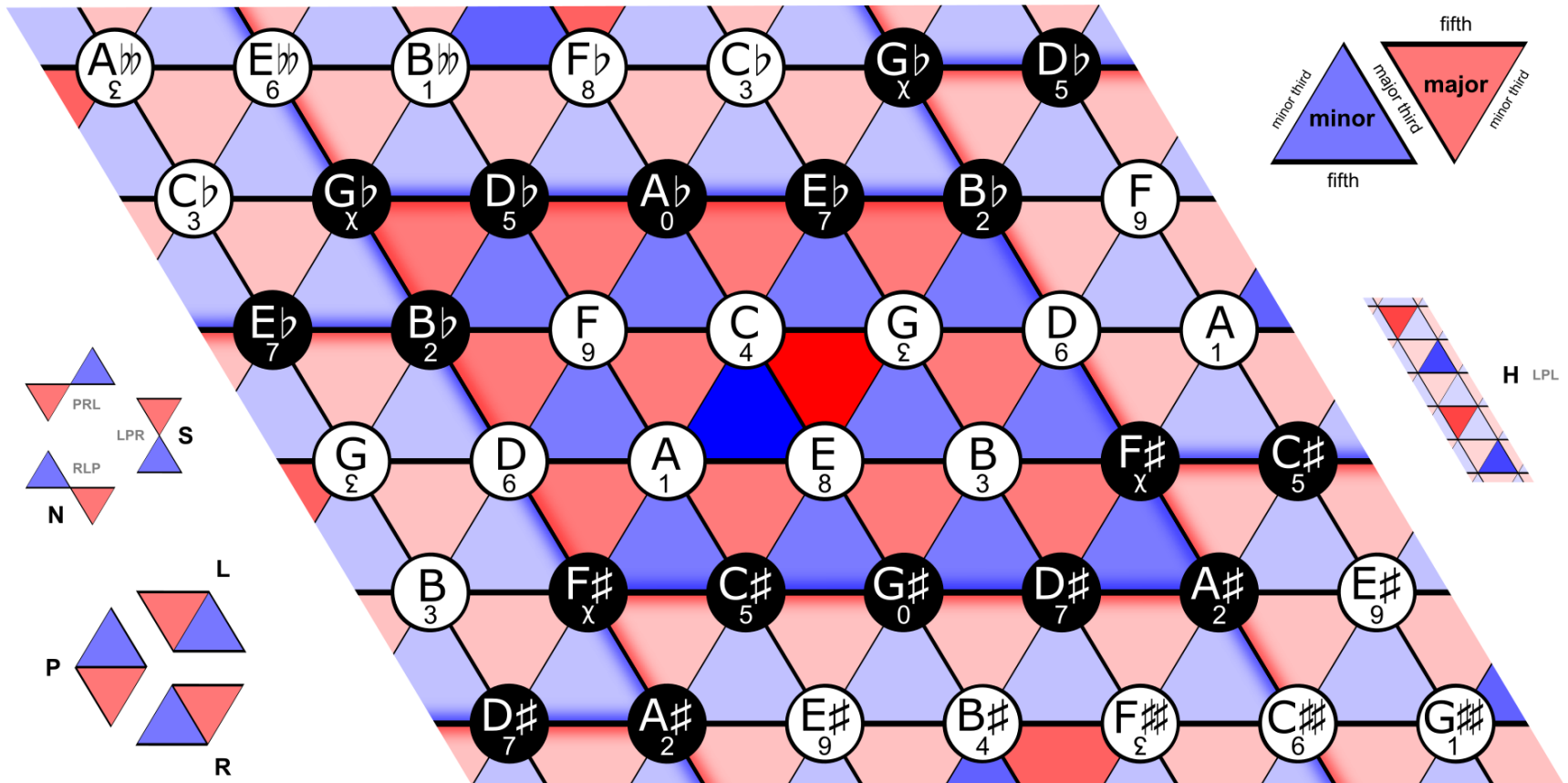
**Glowing sphere:**  
fundamental note.



Spheres around: **notes depending on direction.**

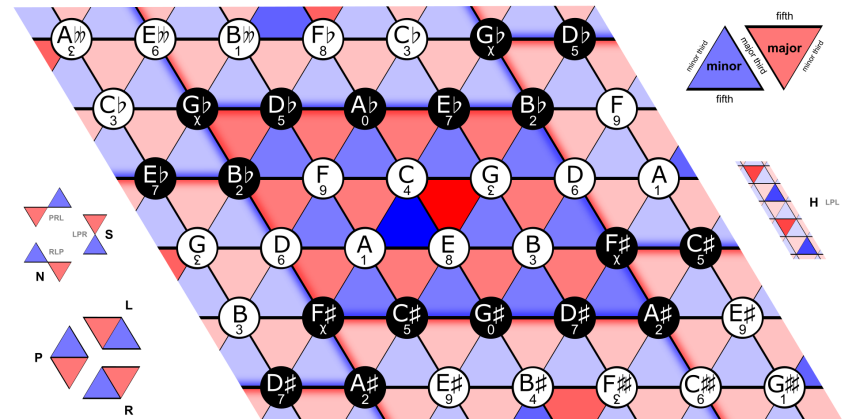
**Reference system:** axis colour matches the colour in the GUI.

# Musical Background: Tonnetz



## Tonnetz:

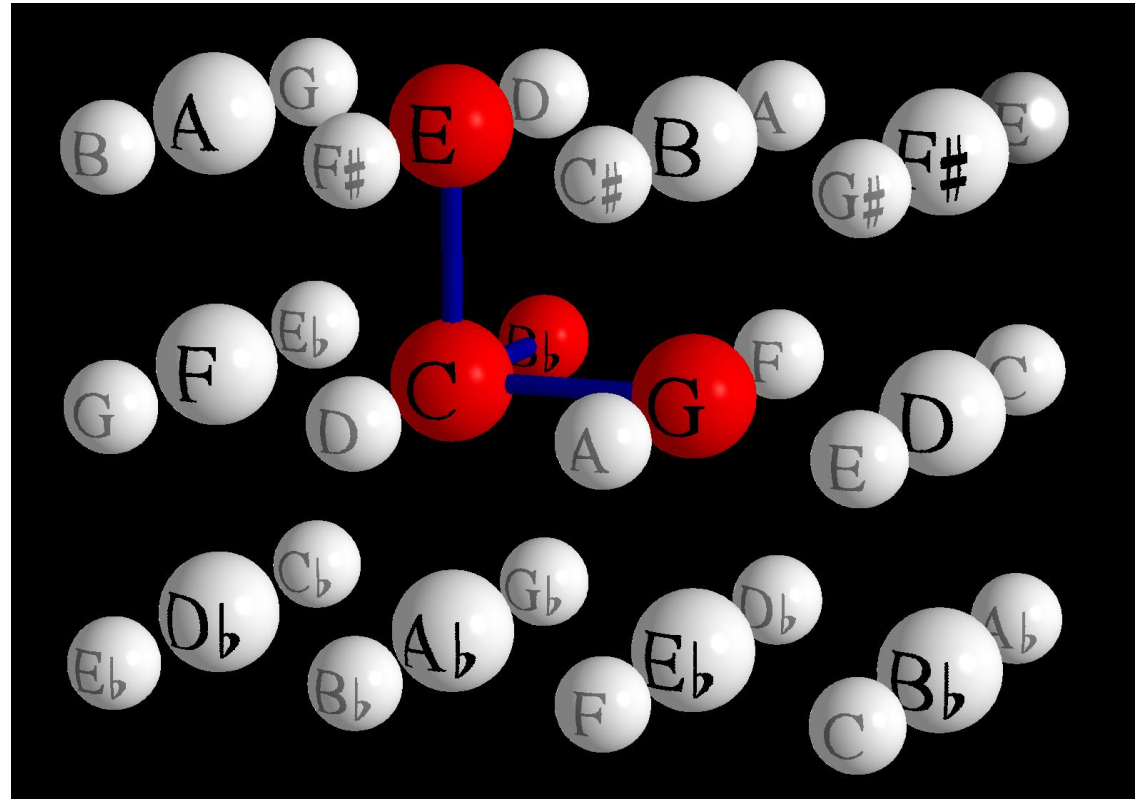
- German for '**tone network**'.
- Conceptual lattice diagram representing **tonal space**.
- First described by *Leonhard Euler* in 1739.
- Useful to illustrate and analyze chords and their relationships.





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- Based on *Euler's Tonnetz*
- Adds a **third dimension** for **sevenths**



# Graphical User Interface

## WAVE FORM:

- Sine
- Square
- Sawtooth
- Triangle

## FUNDAMENTAL FREQUENCY

## OCTAVE

## AXES INTERVALS

- x-axis V
- y-axis M III
- z-axis m VII,  
by default.



The image shows a dark-themed graphical user interface for a 'Sound Generator'. It features several control elements:

- Sound Generator** (Section Header)
- Wave Form**: A dropdown menu currently set to 'sine'.
- Fundamental Frequency**: A dropdown menu currently set to 'C'.
- Octave**: A slider control with a blue highlight and a numerical display showing '3'.
- Axis Interval** (Section Header)
- x-axis**: A dropdown menu currently set to 'V'.
- y-axis**: A dropdown menu currently set to 'M III'.
- z-axis**: A dropdown menu currently set to 'm VII'.
- Close Controls**: A button at the bottom right of the interface.

## Beyond the *Graphical* User Interface :

- Interaction with spheres and space

The user feels involved in the action.

- 3D Spatialized Positional Audio with HRTF

Sensation of real presence.

Figuring out *where* the sound is.



## *Novel instrument design:*

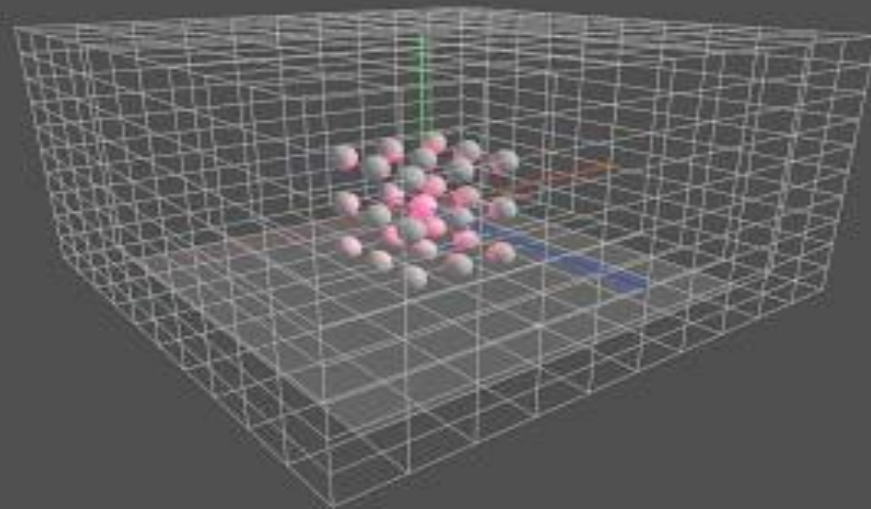
- Expands perceptual and artistic abilities
- Easier perception of harmonic relationships through proprioception
- Internalization of harmonic awareness through body movement
- Innovative multi-user musical interface

## Artistic aims:

- Performances
- Installations
- NFT

## Didactic aims:

- Highlighting the harmonic relationships through interval-space link







**Thanks, hope you enjoy your  
VR-monic experience!**