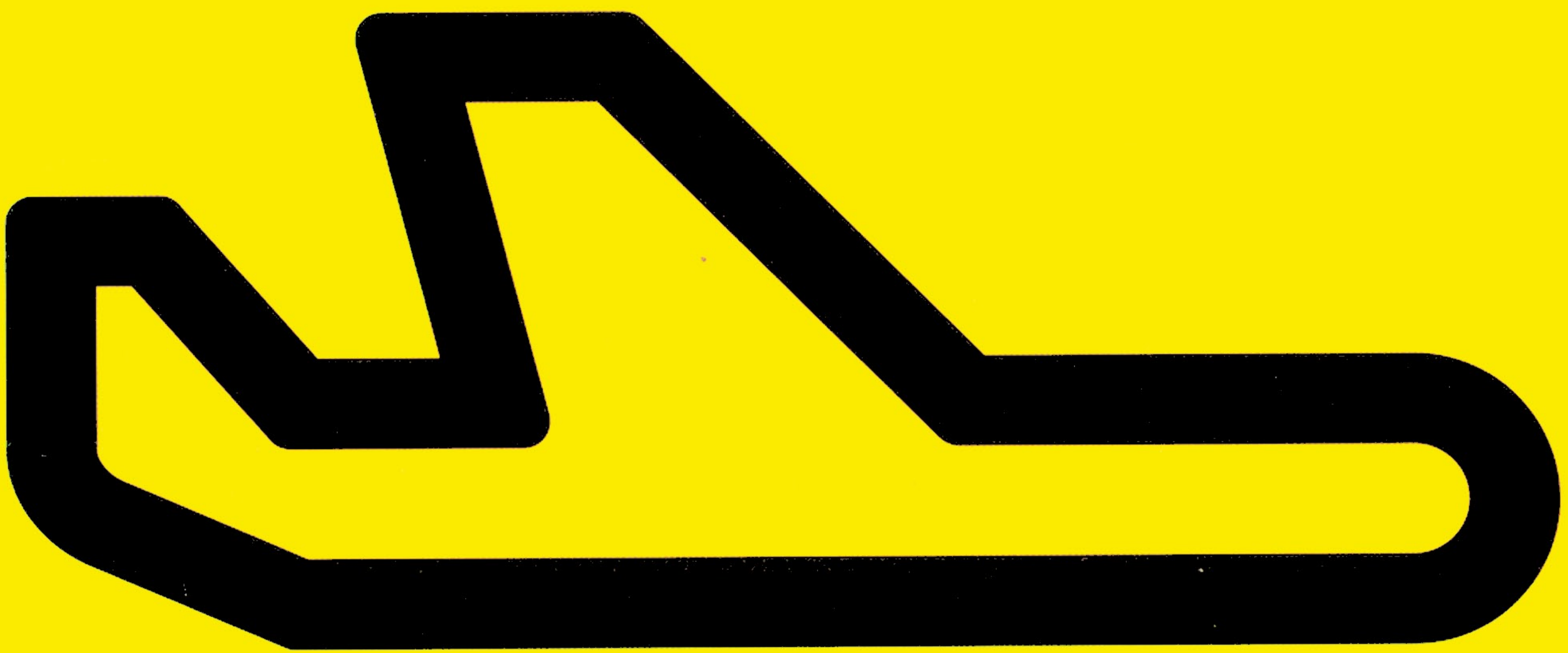


# Experimenta

45  
12,00 €



# Arquitectura digital

LA REVOLUCIÓN DIGITAL ESTÁ OPERANDO UNA SERIE DE CAMBIOS DETERMINANTES EN LA ESENCIA DE LA ARQUITECTURA, LOS CUALES EN MODO ALGUNO ESTÁN RELACIONADOS CON LOS ISMOS DEL SIGLO XX, Y QUE PONEN PUNTO FINAL A LA ARQUITECTURA DE LA MÁQUINA, PRODUCTO DE LA REVOLUCIÓN INDUSTRIAL, ASÍ COMO A LAS CONCEPCIONES CLÁSICAS DE ARQUITECTURA. LAS LÍNEAS RECTAS HAN DESAPARECIDO, LLEVÁNDOSE CONSIGO EL PENSAMIENTO CARTESIANO, QUE HA REGIDO A LA ARQUITECTURA DURANTE SIGLOS Y PARA EL QUE SIEMPRE EXISTIERON ALTERNATIVAS A LA BÚQUEDA DE OTRAS FORMAS Y ESPACIOS (MARGINALES A LA ARQUITECTURA «OFICIAL»). EN NUESTRA CULTURA, EN CUESTIÓN DE POCOS AÑOS Y DERIVADAS DE NUESTRO CONTACTO CONSTANTE CON LA TECNOLOGÍA DE LA INFORMACIÓN, FUNCIONAN CON FLUIDEZ COTIDIANA NOCIONES MENTALES QUE, INDUDABLEMENTE AFECTAN A NUESTRO SENTIDO DE PRESENCIA EN EL MUNDO. AZUZADOS POR TODO EL POTENCIAL DE LA TECNOLOGÍA INFORMÁTICA Y LAS REDES DE INFORMACIÓN DE ESTE TIEMPO –Y DISTINGUIÉNDOSE DE LOS GESTOS ARQUITECTÓNICOS INDIVIDUALES/INDIVIDUALISTAS DE UN CIERTO BLOQUE DEL STAR SYSTEM ARQUITECTÓNICO–, ARQUITECTOS (BLOBMEISTERS O NATURAL BORN CAA DESIGNERS, PARA QUIEN QUIERA LLAMARLES DE ALGÚN MODO) DE TODO EL MUNDO EXPERIMENTAN CON PROCEDIMIENTOS, TÉCNICAS, CONCEPTOS, QUE CONVULSIONAN MÉTODOS DE PENSAMIENTO, DE DISEÑO Y DE REALIZACIÓN. ASÍ, LITERALMENTE, SE TRANSFORMA LA ESENCIA DE LO QUE LLAMAMOS Y RECONOCEMOS COMO «ARQUITECTURA».

NUESTRO PROPÓSITO CON ESTA SELECCIÓN DE PROYECTOS Y DOCUMENTOS ES PONER DE MANIFIESTO LA FORMA EN QUE ESTÁ CRISTALIZANDO ESTA TRANSFORMACIÓN, PLANTEADA POR ARQUITECTOS, Y SUS POSIBILIDADES DE OPERACIÓN SOBRE LAS DIFERENTES DIMENSIONES DE NUESTRO ENTORNO FÍSICO Y TERRITORIOS MENTALES. NO HEMOS QUERIDO HACER DISTINCIONES ENTRE PROYECTOS ESTRICTAMENTE ARQUITECTÓNICOS Y EL DISEÑO INDUSTRIAL, YA QUE ESTE ÚLTIMO SE ANTICIPA AL TRATAMIENTO DE LOS MATERIALES QUE LA ARQUITECTURA PROPONE EN PROYECTOS GENERADOS DIGITALMENTE, CONSTITUYENDO EL MÁS ÓPTIMO CAMPO DE PRUEBAS POSIBLE. POR OTRO LADO, LA SELECCIÓN DE PROYECTOS ARQUITECTÓNICOS INTENTA DEJAR PATENTE CUÁLES SON LOS INTERESES DE INVESTIGACIÓN DE LOS DIFERENTES ESTUDIOS SELECCIONADOS, MÁS ALLÁ DEL TIPO DE ATENCIÓN A LAS PREGUNTAS Y RESPUESTAS QUE DE ÉL EMERGEN. NOS PARECE CRUCIAL DESTACAR EL HECHO DE QUE NO NOS HALLAMOS ANTE UN FENÓMENO HOMOGENEIZADO NI HOMOGENEIZADOR, MOTIVO POR EL CUAL RESULTA ESENCIAL PONER DE MANIFIESTO LA DIVERSIDAD DE APROXIMACIONES Y LAS CONTRADICCIONES ENTRE ELLAS. ÚNICAMENTE DE ESTA MANERA ENTENDEREMOS QUE NOS HALLAMOS ANTE UN FENÓMENO QUE EXISTE.

FREDY MASSAD Y ALICIA GUERRERO YESTE

LAB[au] - laboratory for architecture and urbanism  
 Manuel Abendroth, Jérôme Decock, Pieter Heremans and Alexandre Plennevaux

Founded in 1995 LAB[au], the Belgian laboratory for architecture and urbanism, links theoretical research LAB[a+u] to concrete works of conception and productions, LA.BAU in order to examine the transformation of cultural artifacts \_ signforms according to the technological progress. The different sectors of LAB[au] thus present the broad range of activities which opens up by the use of Information and Communication Technologies in these fields and the emerging / setting of a new discipline \_ MetaDeSign.

In this manner the development of the 0.1lab stands for new networked production environments as well as the base for a new matrix of social interaction and collective space; LAB[au]+ for the creation of a collaborative agency examining these transformations within various disciplines \_ transdisciplinary processes. According to this method LAB[au] elaborates a ' MetaDeSign ' investigating the implications of new communication and computation technologies within spatio-temporal structures and their multiple forms of representation, such as information architecture, architecture, urbanism...

Official website: <http://www.lab-au.com>

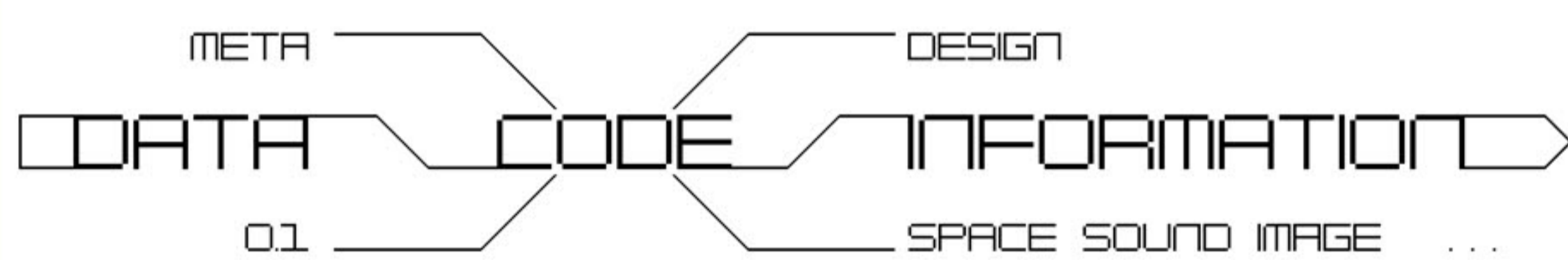
**MetaDesign :**

A technology is not an independent or alien object, it complements integrally our sensorial and cognitive system; as a medium, it conditions not only communication modes but also the way we perceive and conceive our environment.

The technological developments of the last decades are at the base of the shift from industrial to post-industrial information society, where computation and communication technologies extend our very 'senses'. The notions of body, matter, space and time are increasingly defined by the unit of information; its structures, processes and systems introducing new parameters of space and time - presence, such as immersion (real/virtual) and interaction (real-time/entropy) as well as new parameters of materiality (nano-technologies and smart memory materials) or biological (gene technologies) ones in its definition. Technology based on the transmission, computation and storing of information thus influences organization models (modes of production, work and knowledge) and affects the communication process (code, symbol) and the social relations as well as their spatialisation / representation.

Architecture and Urbanism are structural and functional disciplines involved in the spatial and temporal organization / representation of social, economic, political...structures through which they also constitute a semantic system of signs and codes. The shift from architecture to MetaDeSign is the result of the comparison between communication modes, its structures (indexing + linking) and processes (computation + communication) and spatial constructs (architecture and urbanism) enhanced by technologies \_ and thus is based on its organizational principles binding high level of abstraction ( codes ) within specific modalities of perception and cognition in the construct of meaning – semantic level.

In this manner the investigation in MetaDeSign is the investigation in design, its methods and processes grounded on the inherent logics of computation and communication technologies in the visualisation and formalisation of inFORMation processes in textual, graphical, spatial representations. In summary, MetaDesign is about the setting of codes / language drawn from concepts of communication and information sciences - cognitive science with that of process methods, design and spatial constructs – architecture in the general cultural paradigm and in the production and conception of signforms. It outlines the spatial and semantic mutation provoked by technologies on the perception and conception of our environment. 'MetaDeSign' thus can be understood as a technology determinism that constitutes the main vector/thought in the concern of networked, information-based societies.



**From Code to DeSign \_ Space**

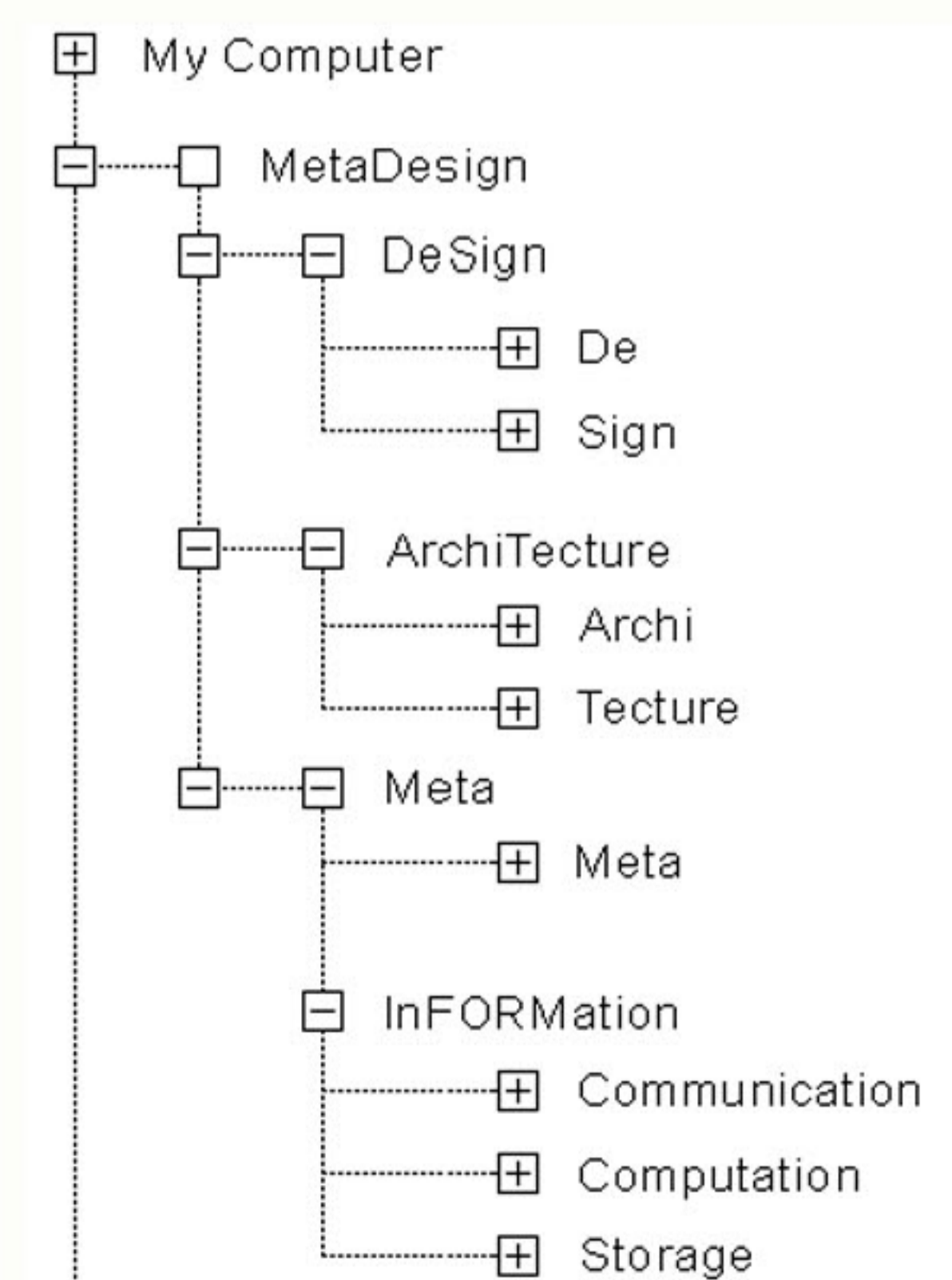
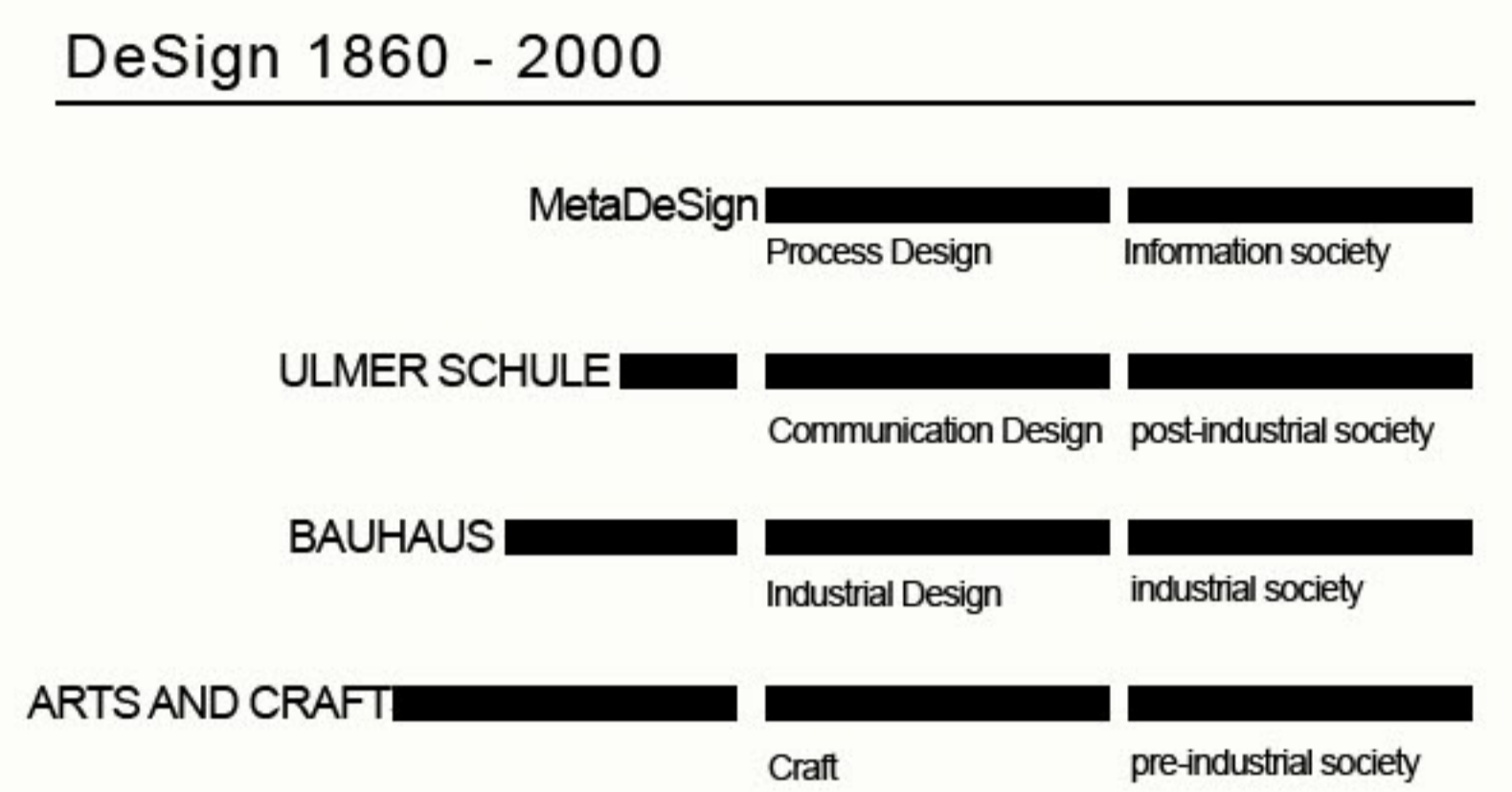
In order to illustrate the influence and information mapping ( hypermedia ) \_ the assignments of sonic, visual, spatial...parameter, and the determining of sign\_forms through programming logics and thus the production and conception cultural artifacts but also our notion of space and the way we experience it, different examples from the recent project 'sPACE, navigable music by lab[au] are displayed:

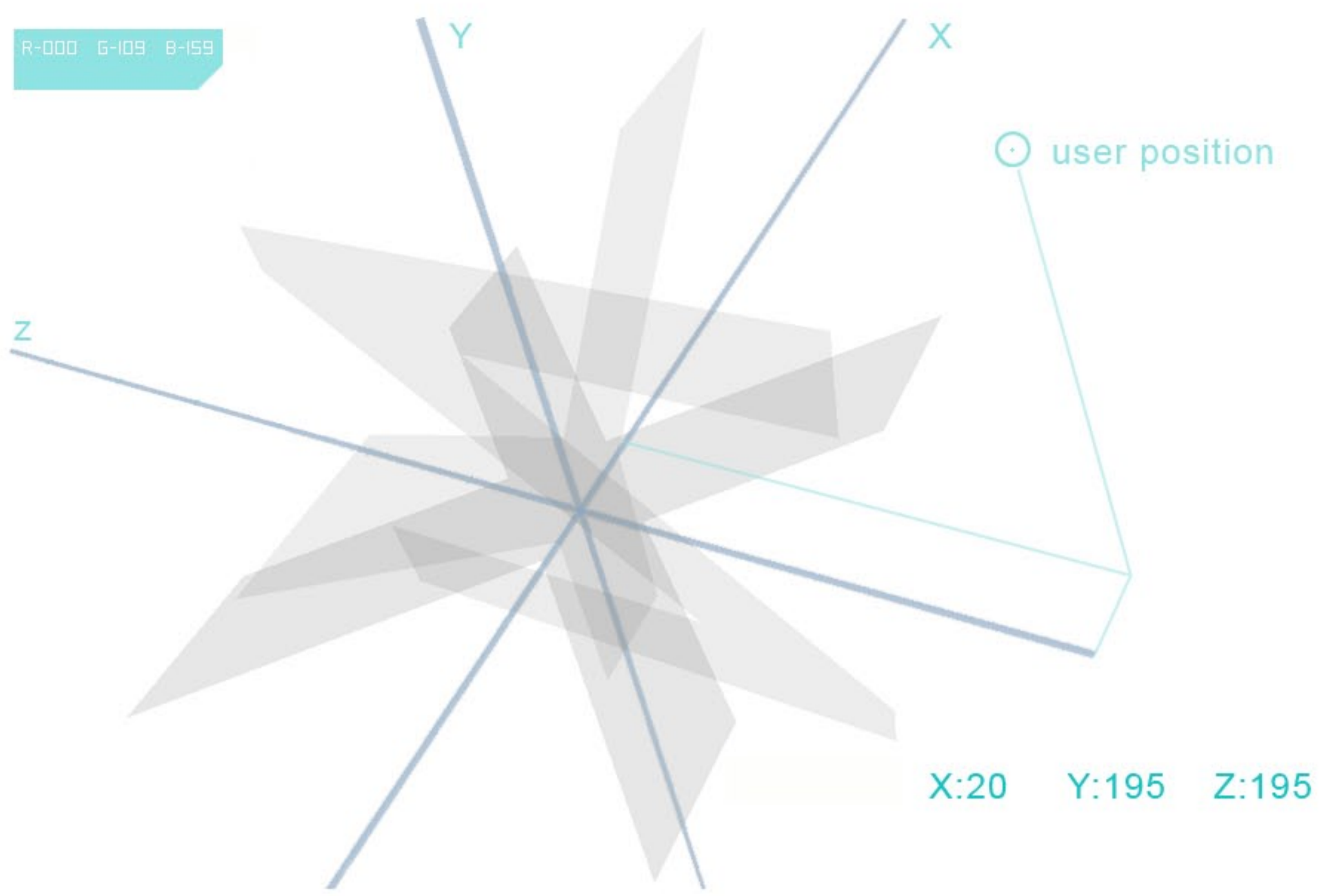
- | page 2 | COLOR SPACE
- | page 3 | SONIC SPACE
- | page 4 | E.MOTION SPACE
- | page 5 | RHYTHMIC SPACE

**Color Space:** assignment of space coordinates \_ XYZ to color coordinates R= 0-255 G= 0-255 B 0-255. This assignment allows to mix the 16.777216 colors of a screen through navigation about also the representation of electronic space \_ the position of a user \_ in form of a color map. A representation of space through colors. The projection of these color enlightening the space of the performance//installation thus relates the electronic-space to body-space on both levels: cognitive and perceptive.

**Sonic Space:** assignment of space coordinates to sound (volume) values. The control of volume according to space coordinates (distance + position ) creates a spatial system like quadra, octa ...polyphonic diffusion of sound \_ spa[z]e music. This spatialisation system of sound thus relates the navigation in electronic space to the physical experience of music during the performance \_ a mixed reality through the visual and sonic interrelation of e.space to body space.

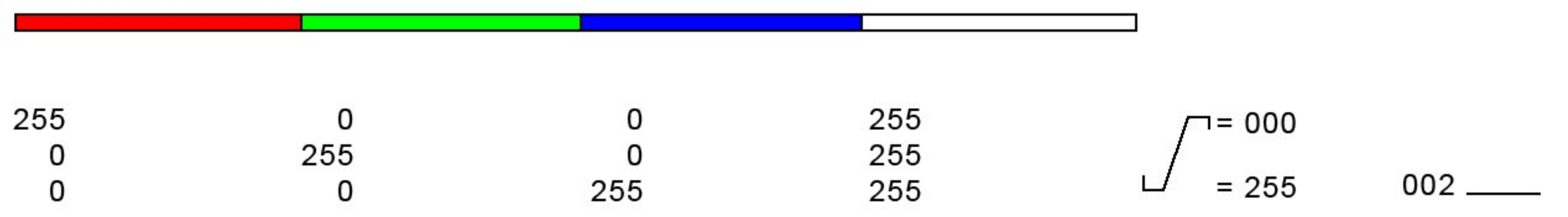
**E.Motion Space:** assignment of camera values ( field of view ) to sound frequency \_ the pitching of sound. The Changing of the field of view of the camera through witch one navigate thought the electronic space \_ constituting its vision perception inside it, is assigned to the one of hearing – sound frequency. On the camera principals is based the networked real-time 360°projection system but also the general construct of the project where the change of the visual and spatial construct is directly related to the sonic one and thus extend e.space navigation



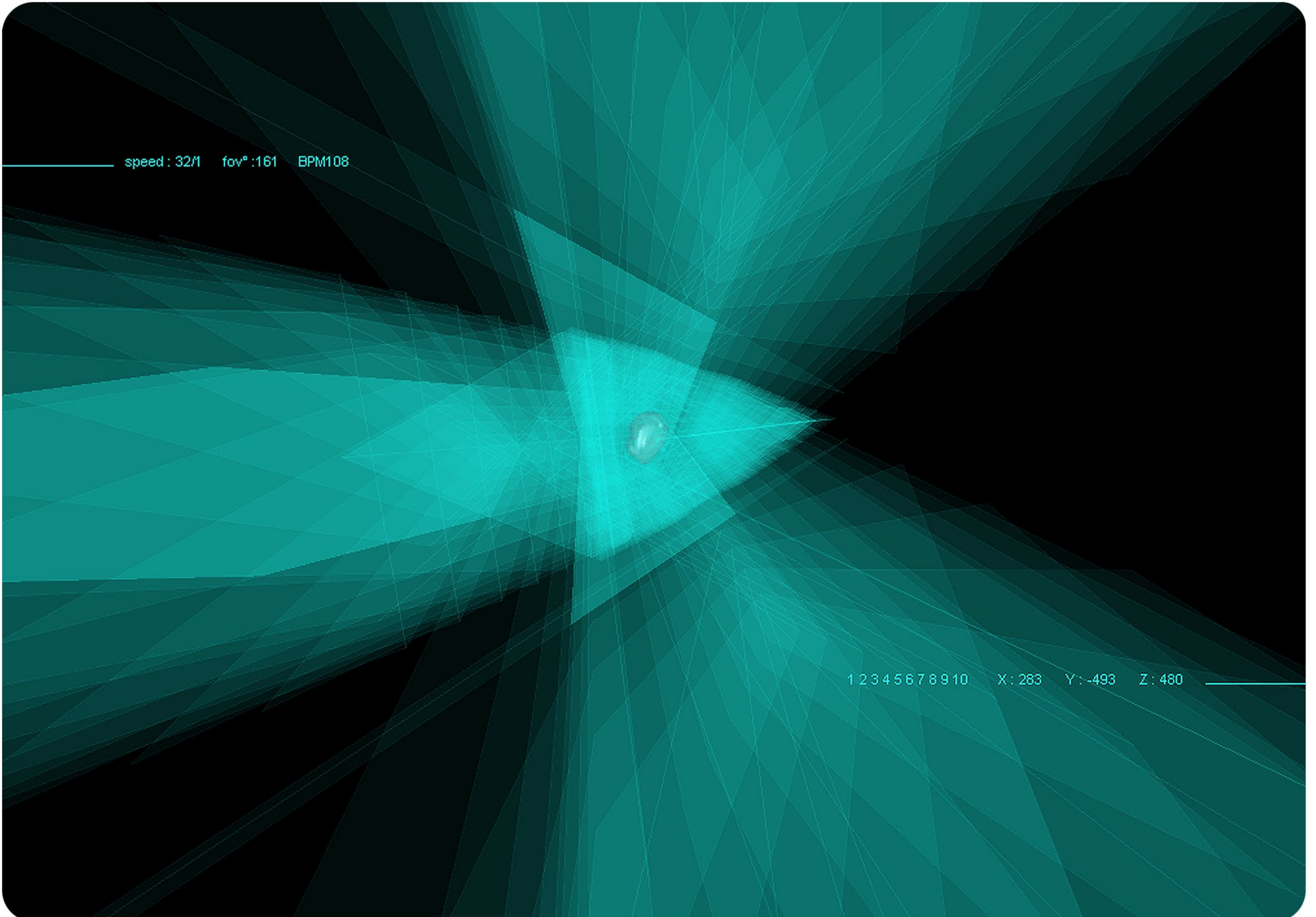


</Pseudo Code>

Variable [Integer 8bits] Red, Green, Blue  
 Object Camera  
 Red = Camera Position X [0,255]  
 Green = Camera Position Y [0,255]  
 Blue = Camera Position Z [0,255]  
 Camera Clear Creen Color = Red, Green, Blue  
 $255+255*255=16777216$

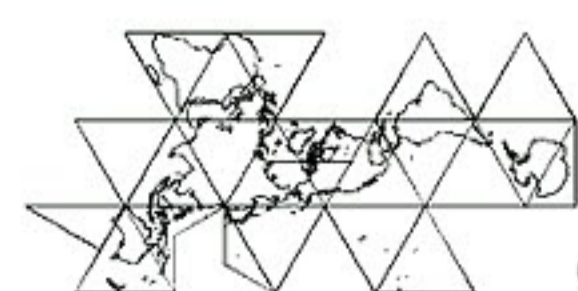


\_\_\_\_ META

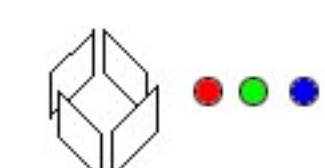


\_\_\_\_ DE.SIGN

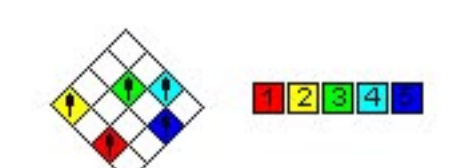
SPA[Z]E 360°



COLOR\_SPACE MAP

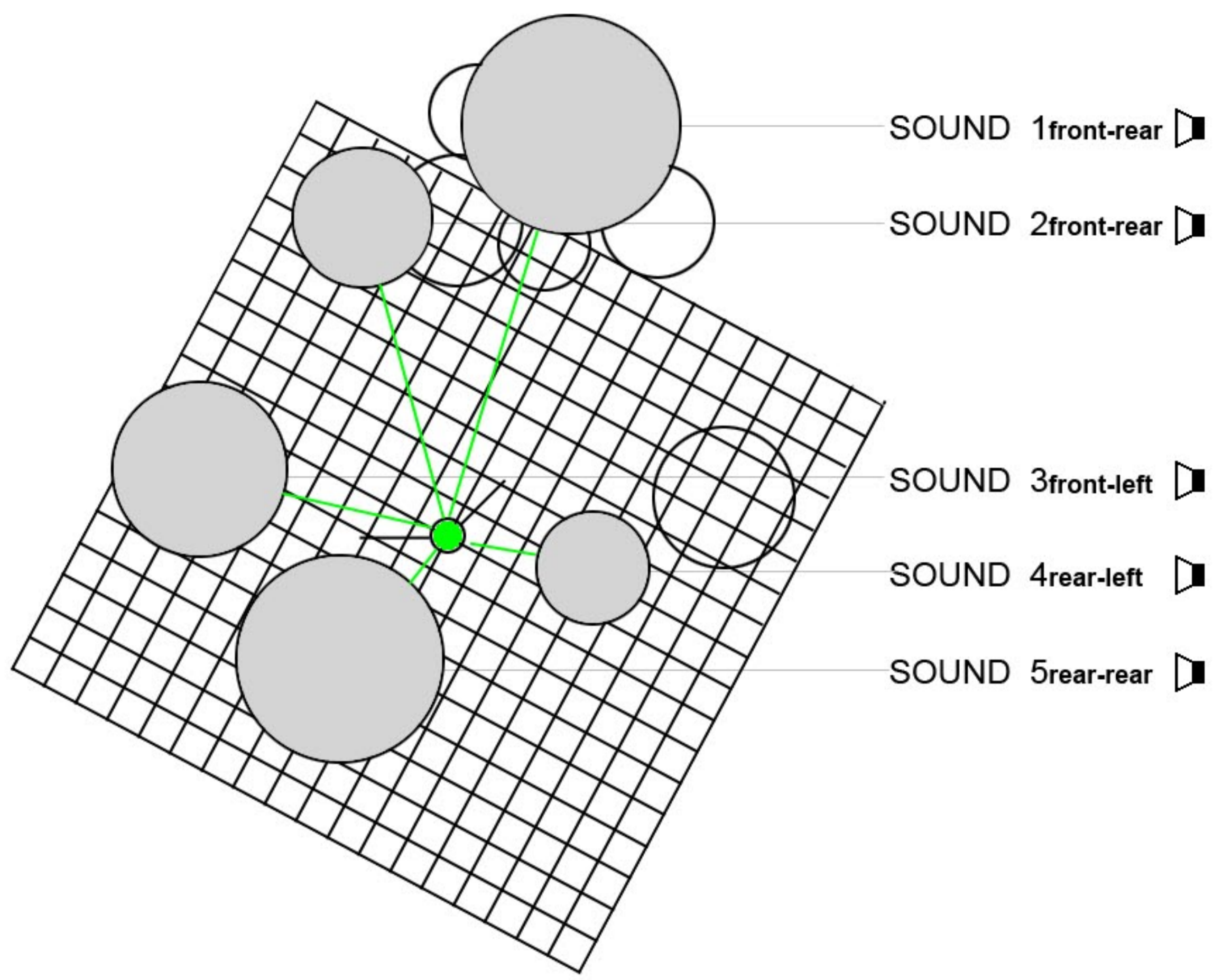


DMX COLOR LIGHT CONTROL



MULTIUSER POSITION MAP

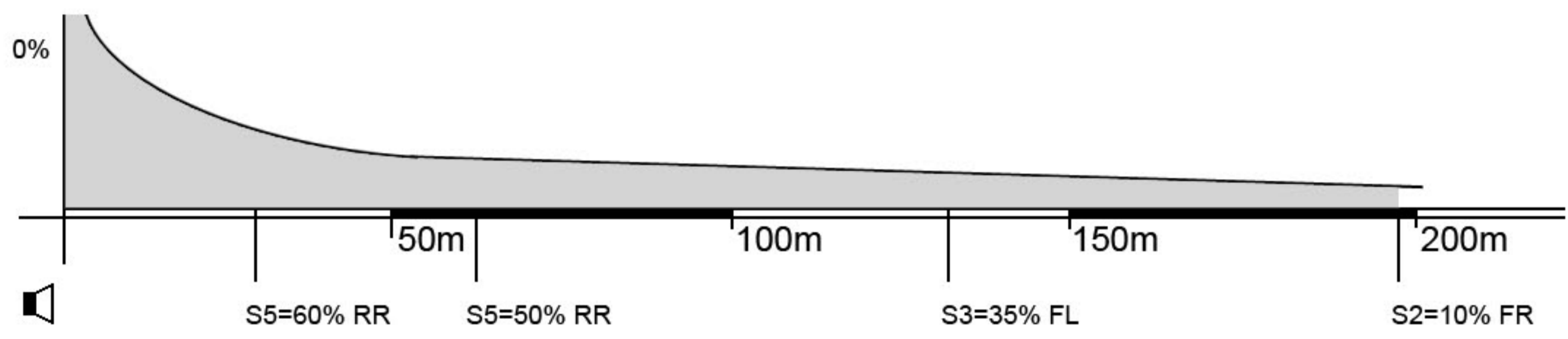
<\SPACE><\SOUND> SONIC SPACE



</Pseudo Code>

```

Variable (Float 4bytes) Loudness, FrontLeft, FrontRight, RearLeft, RearRight
Object Camera, SoundSphere, Vectors
//Distance attenuation
DistanceVector(length) = DistanceCamera (X,Y,Z) SoundSphere (X,Y,Z,Size)
if DistanceVector(length) <=Size
    Loudness =1.0
else
    Loudness=1.0 / DistanceVector(length)
end if
//Loudness for each speaker (repeat for each speaker/vector)
if DistanceVector(angle) to Camera(frontrightangle) <=90*
    FrontRight%=100%*(1.0(DistanceVector(angle)toCamerafrontrightangle)/90*)
end if
    
```



USER POSITION SPACE

DISTANCE



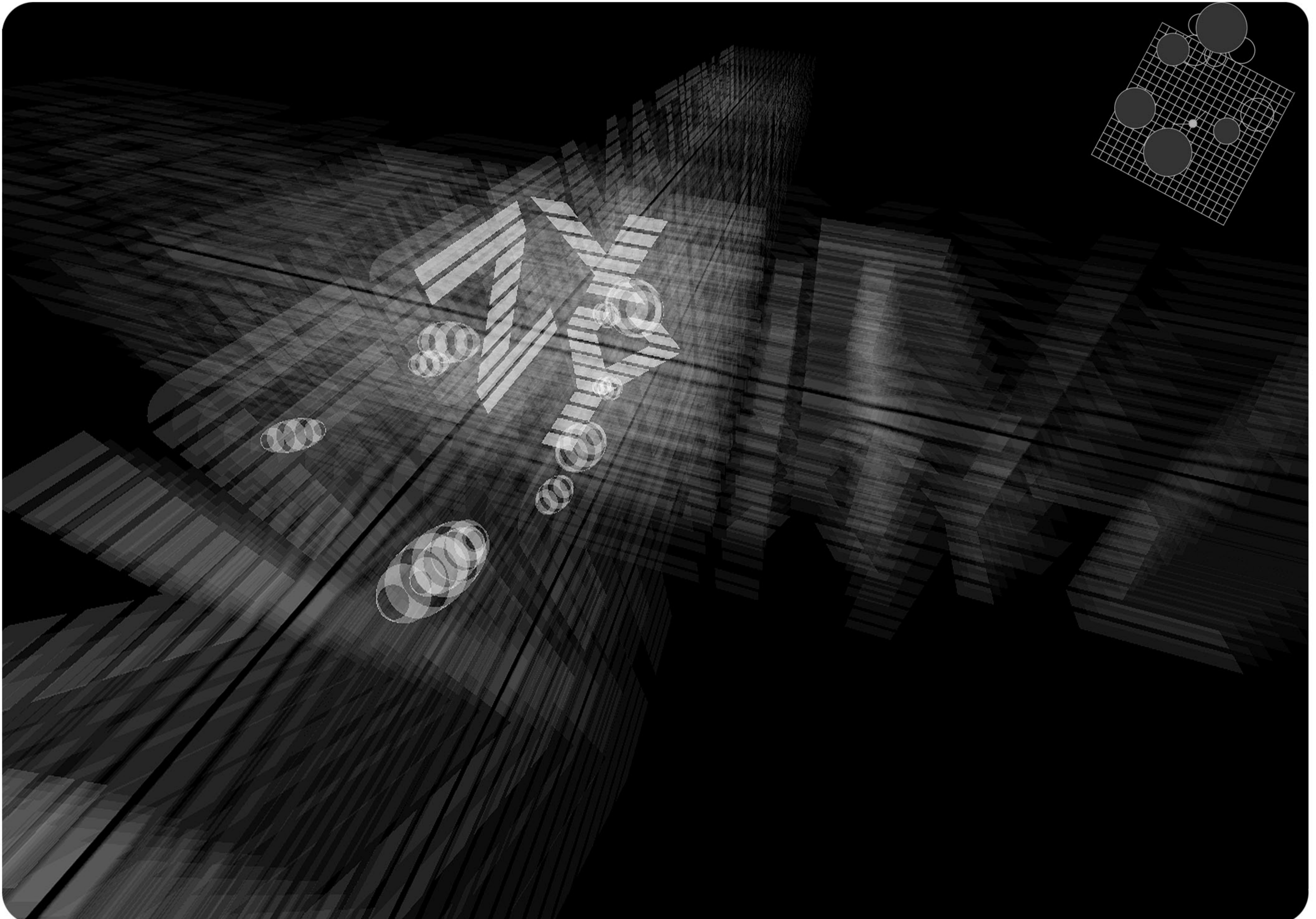
S5=60% RR

S5=50% RR

S3=35% FL

S2=10% FR

004

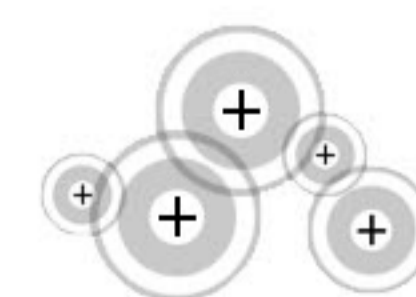


QUADRAPHONY / SPACE MUSIC



X = LEFT-RIGHT  
Y = TOP - BOTTOM  
Z = FRONT - REAR

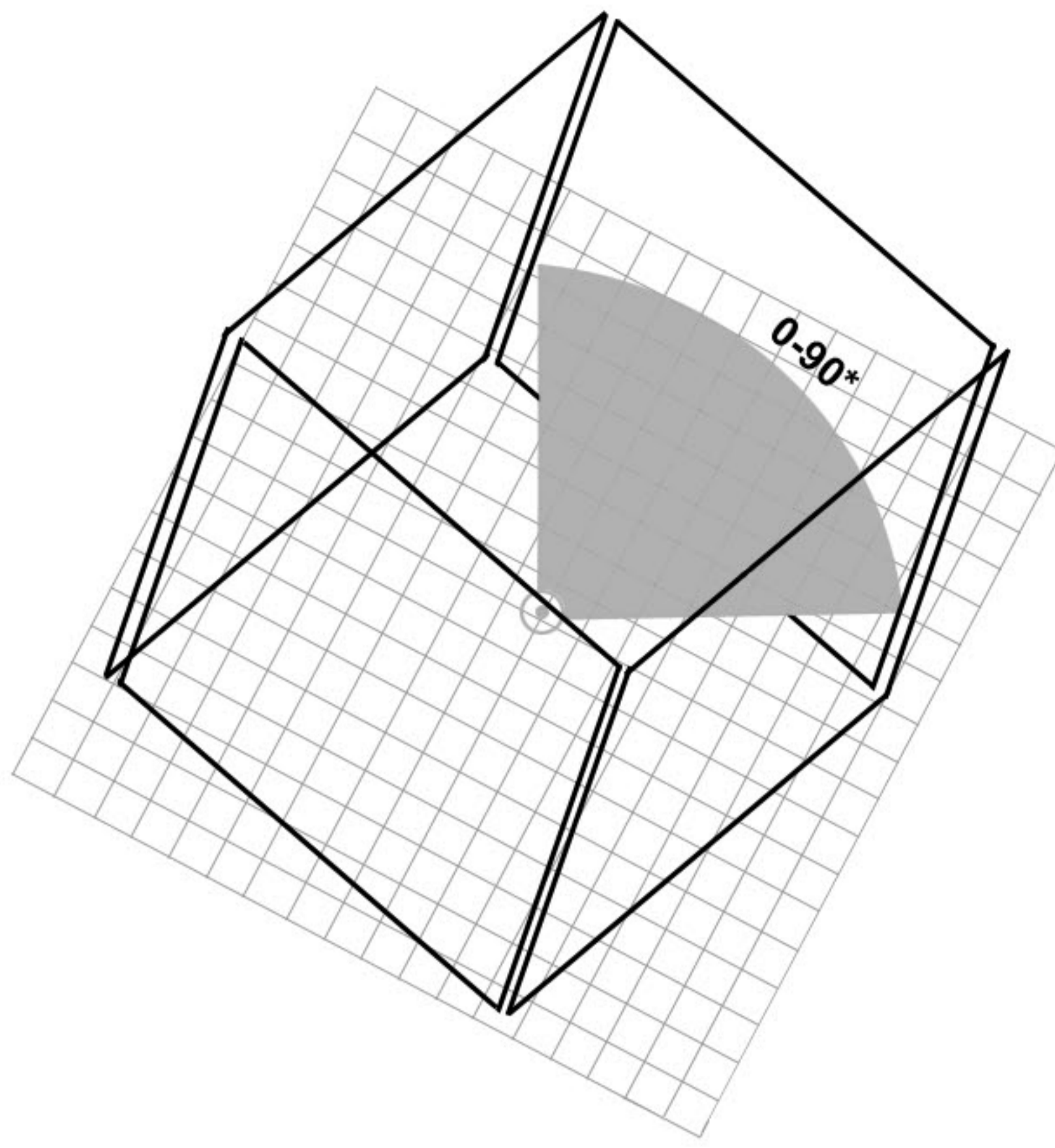
OCTOPHONY - 8 SPEAKERS



FREE POSITION  
FREE ORIENTATION

N SPEAKERS

<SPACE><CAMERA> E.MOTION SPACE



- Computer 1 0-90°
- Computer 2 90°-180°
- Computer 3 180°-270°
- Computer 4 270°-360°

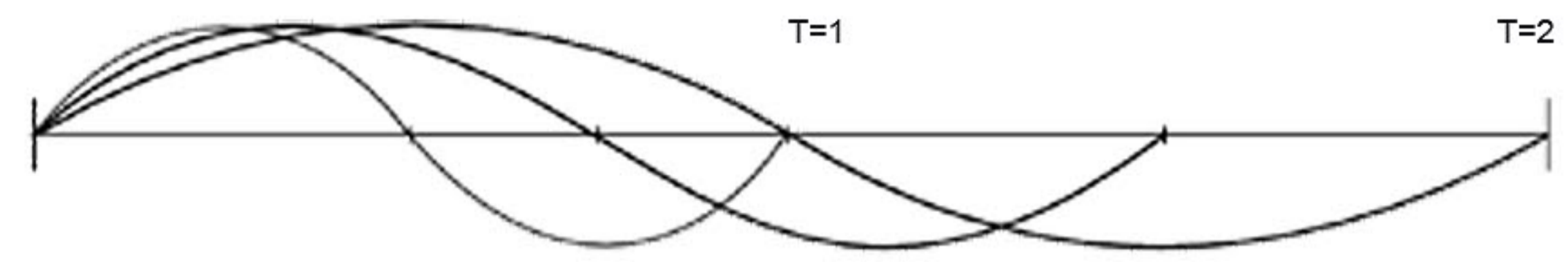
PROJECTION SPACE 360°

</Pseudo Code>

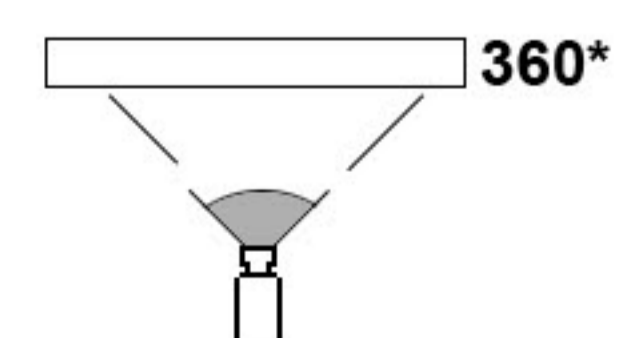
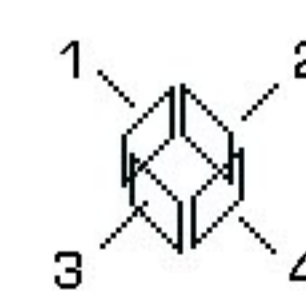
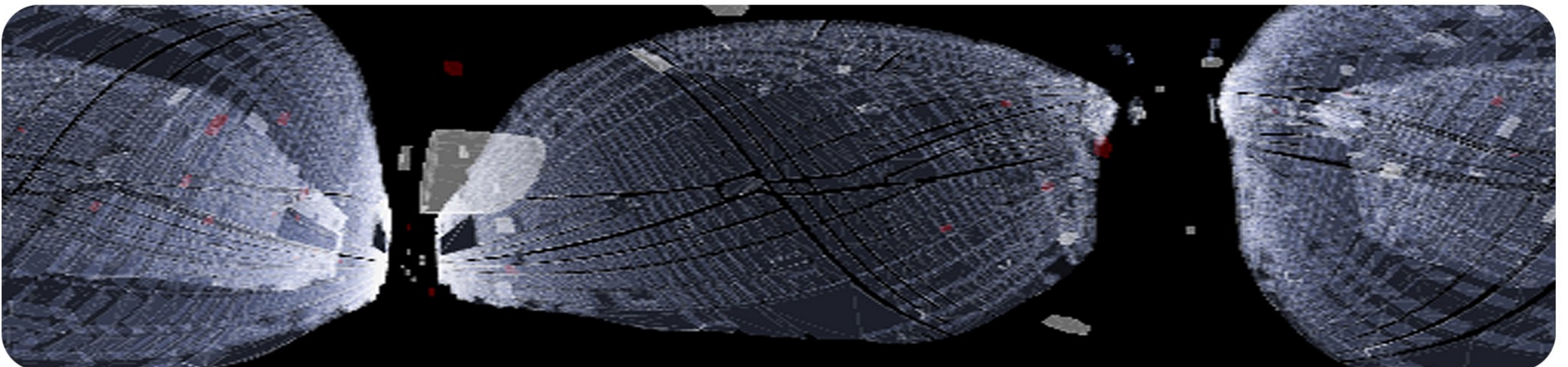
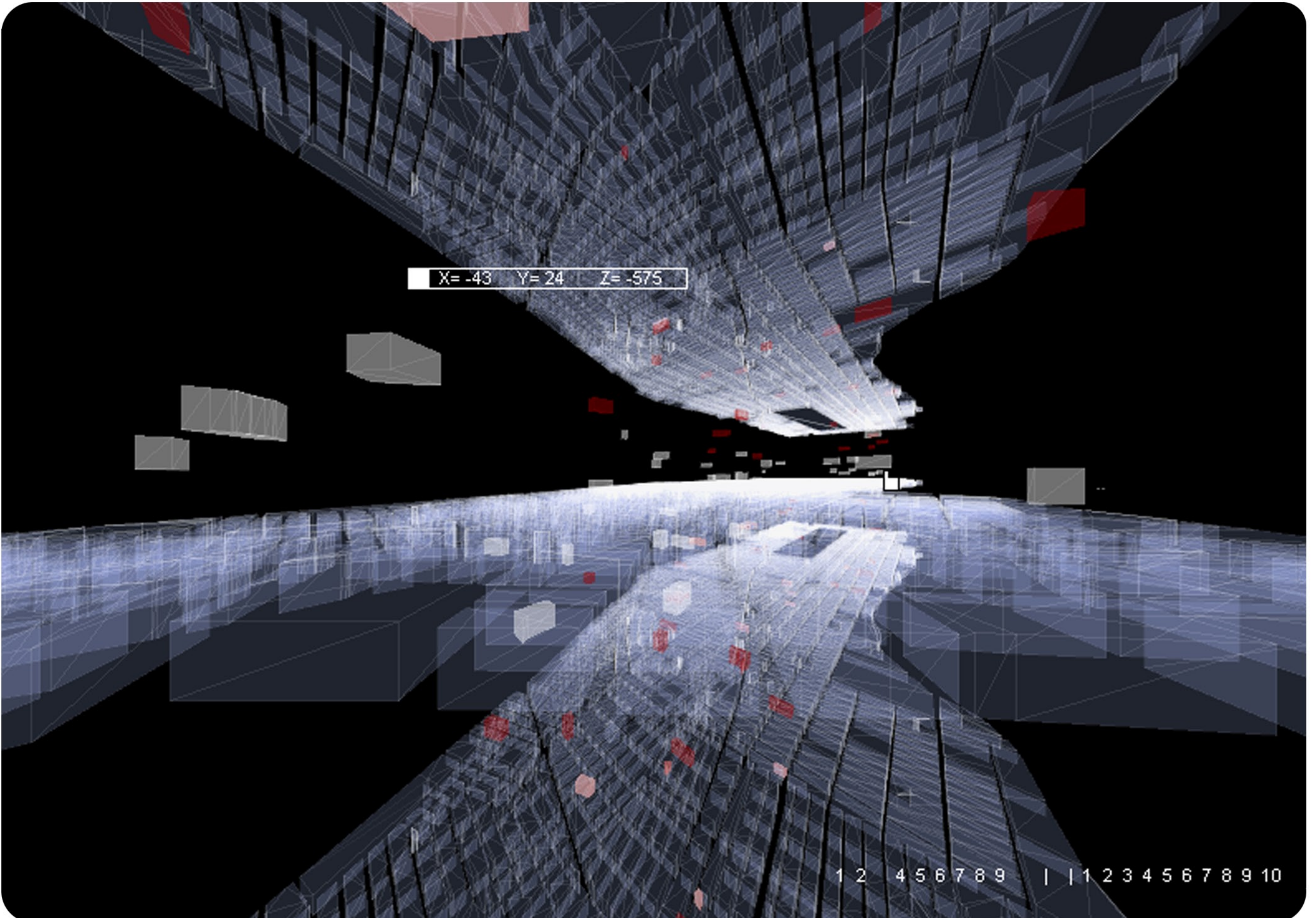
Variable [Float 4bytes] FieldOfView  
Variable [Integer 16bits] SoundPitch

Object Camera  
//Keyboard Motion Control  
If keydown(arrowup,arrowdown)then Move Camera Forward/Backwards  
If keydown(arrowleft,arrowright)then Turn Camera Yaw  
If keydown(8,9) then FieldOfView Camera Zomm/Unzoom

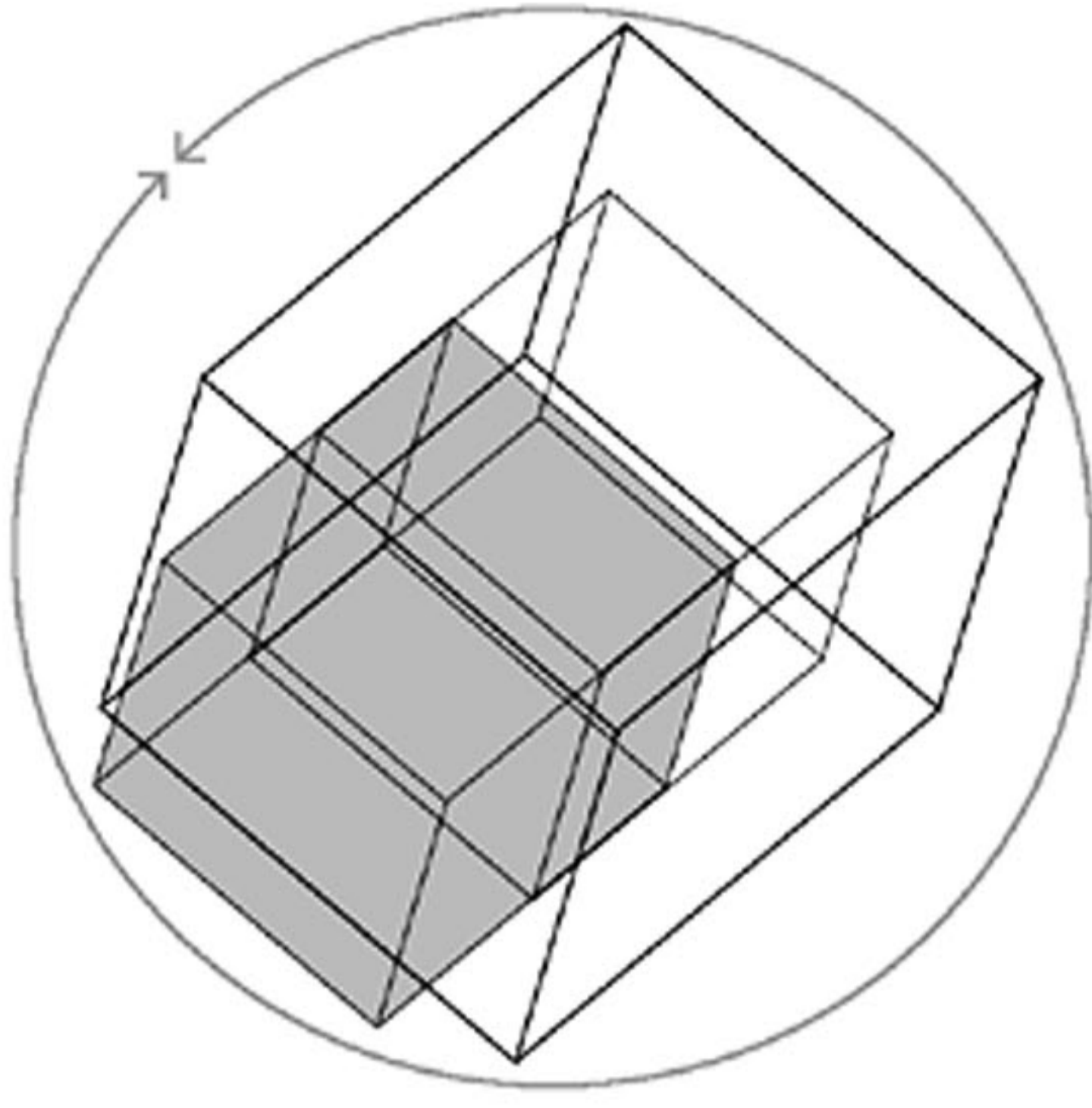
//Playback Rate Assignment  
SoundPitch=(67\*/FieldOfView(Caer))\*44100Hz



SOUNDFREQUENCY	92000 HZ	44100 HZ	33075 HZ	22050 HZ
CAMERA ANGLE	180° F.O.V.	90° F.O.V.	77.5° F.O.V.	45° F.O.V.



<SPACE><SOUND FREQUENCY > RHYTHMIC SPACE



OBJECT BEHAVIOUR

**COLOR**  
 R G B x (0-1)

**SCALE**  
 SX SY SZ x (0-1)

**ROTATION**  
 RX RY RZ x (0-1)

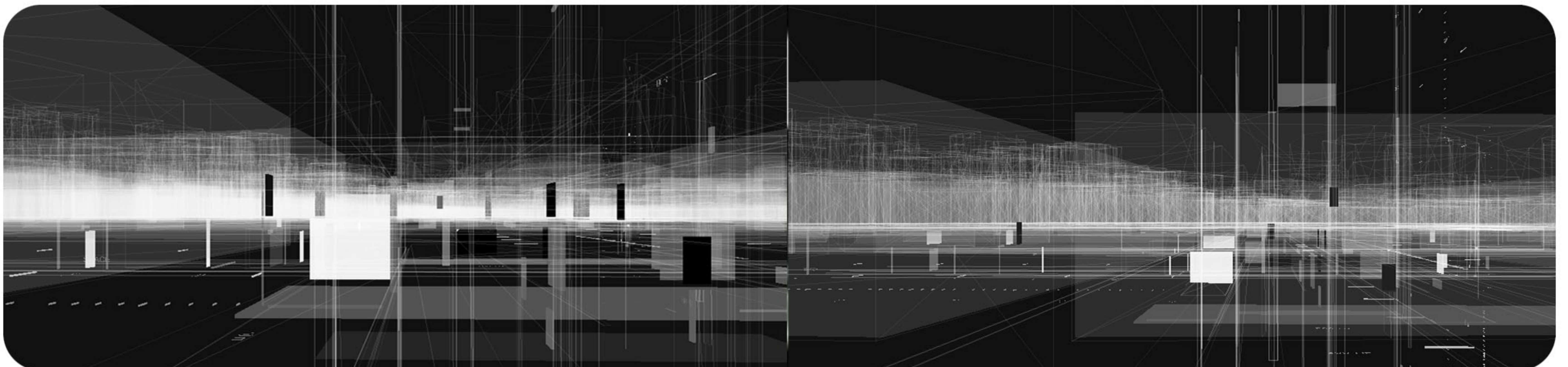
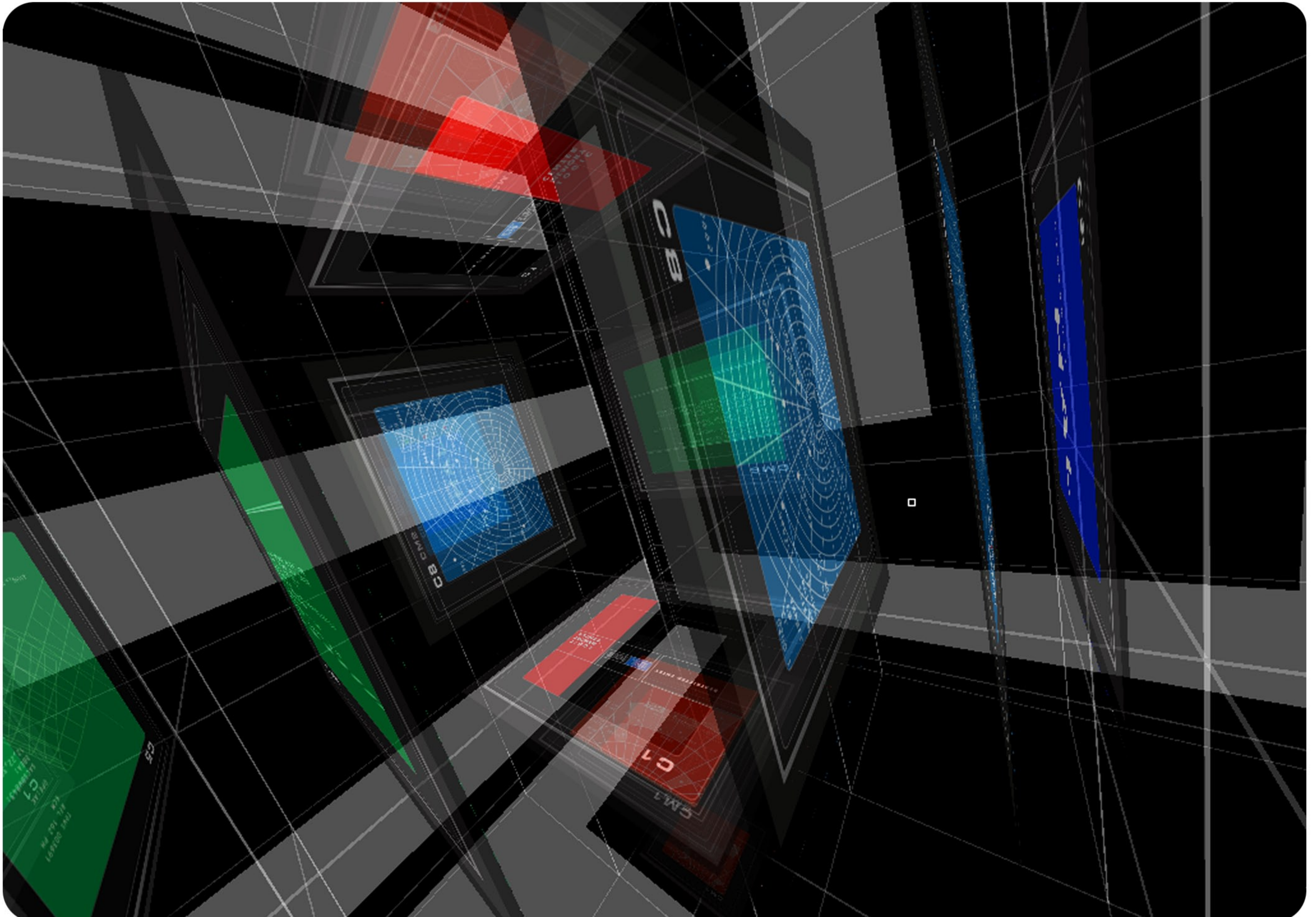
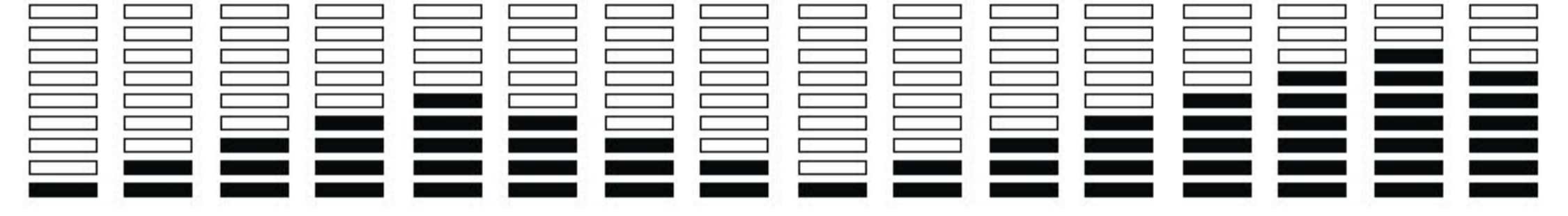
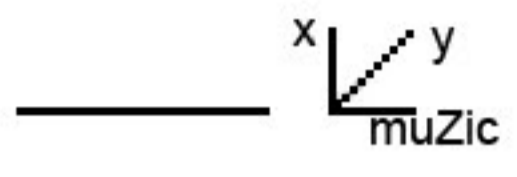
**POSTION**  
 X Y Z x (0-1)

**TRANSPARENCY**  
 100% x (0-1)

</Pseudo Code>

```

Variable (Integer 8bits) FrequencyRange
Variable (Float 4bytes) Value
Object Polygon Mesh
Value = Fast FourierTransform (Soundstream)
Select
Case Color
    PolygonMeshColor = Color*Value
Case Scale
    PolygoneMeshScale = Scale*Value
Case Rotation
    turn PolygoneMesh,Value
Case Position
    move PolygoneMesh,Value
Case Transparency
    PolygonMeshAlpha = Alpha*Value
End Select
    
```



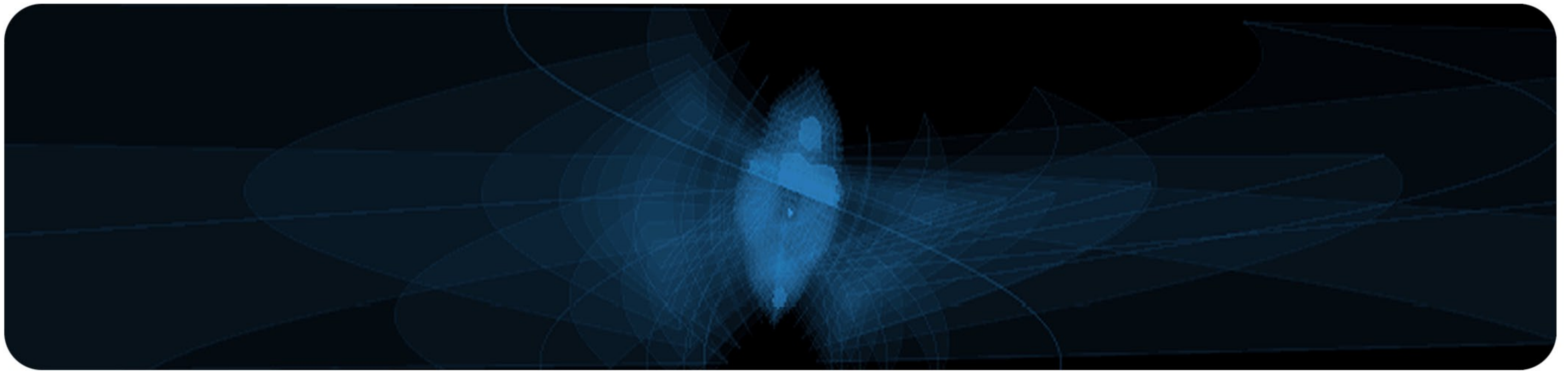
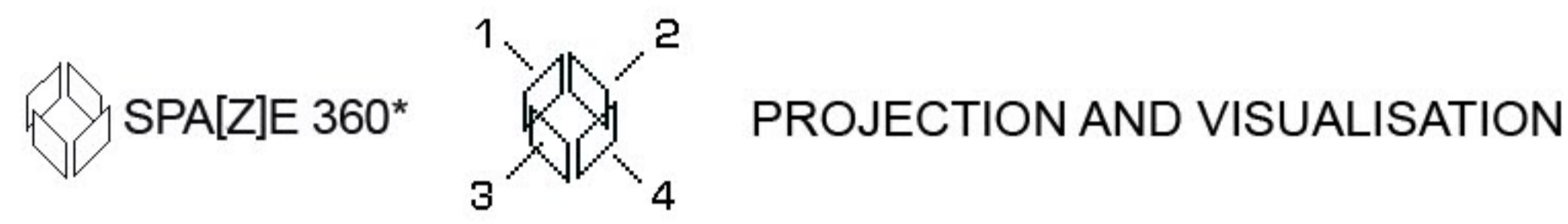
< space navigable music >

sPACE, Navigable Music' investigates the impact of IC technologies and particularly, 3D Real Time technologies in the construct of space. According to the objectives of lab[au] the project constitutes as much a space for theoretical research as a space of experimentation on the forms of spatial, visual and sonic interactions in networked environments. The project thus explores the setting of hypermedia environments and mixed reality spaces combining architecture, music and cinema through users interactions – navigation within the digital matrix.

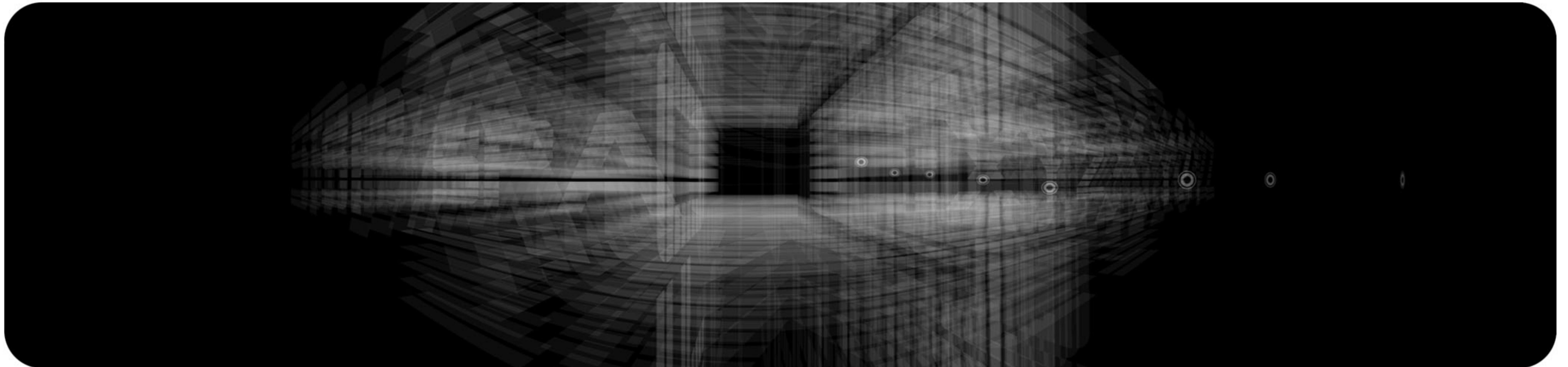
In sPACE, navigable music, the architecture of the electronic space is generated in real time according to the position and movements of the user (> mix color, > mix image, > mix sound). Operating on the assignment of spatial (x,y,z), temporal (t-movements) parameters to the visual and sonic ones, each interaction by the user, navigation, transforms the rendered space. The 'Navigable Music' thus constitutes a space, in which the user experiments cyberspace by dropping sounds into space, mixing music throughout navigation, record its movements to produce an animation, a kinetic music clip, a sharable sonic space, where the multi-user space even extend the project to collective interactions.

SPA[Z]E music is based on collaborations between lab[au] and different contemporary musicians, who composes specific sonic - spaces, navigable music. The collaboration focus on the exploration of musical patterns in and through navigation in e.space and relate them to image sequencing in order to create an immersive sonic and visual environment. It thus relates, synchronizes, space to music based on cinematic techniques and movement patterns.

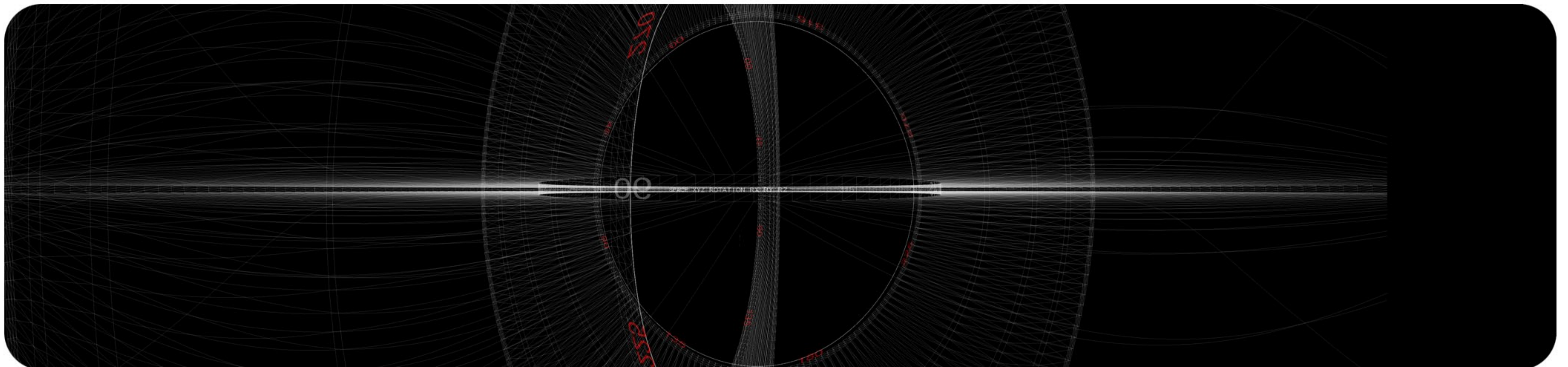
The spa[z]e 360° project is based on a software, developed by lab[au] in order to propose an installation based on a complete immersion of the users/public in the spa[z]e music produced on the one hand through the spatial \_quadraphonic diffusion of the sound navigation and on the other hand the visual \_360° panoramic projection of the e.space ; all rendered in real time. In this manner the public gets immersed in the 3D visual and sonic environment of spa[z]e music where the sharing of the rendered music is the sharing of the sensation of movement and speed in the non gravity e.space.



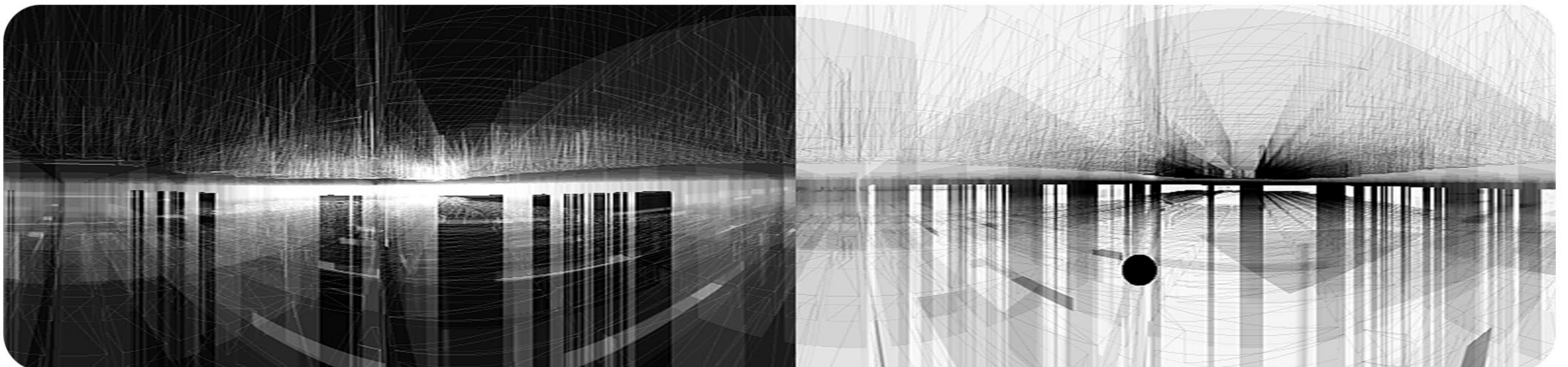
COLORSPACE360°



space\*time\*information\*



360°



spaze