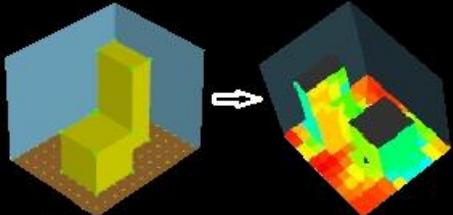
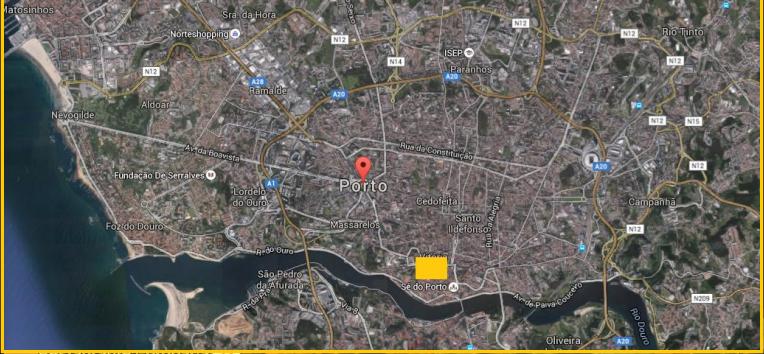


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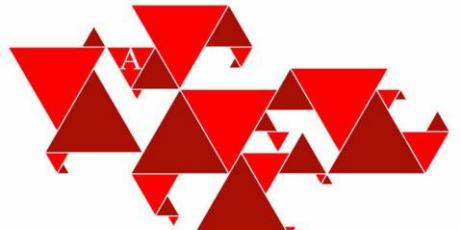


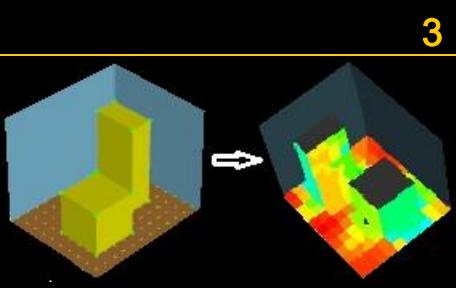
DepthSpace3D:
a new digital tool for 3D
Space Syntax analysis
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Isovista of Torre dos Clérigos in a 2D analysis

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ARCHITECTURE





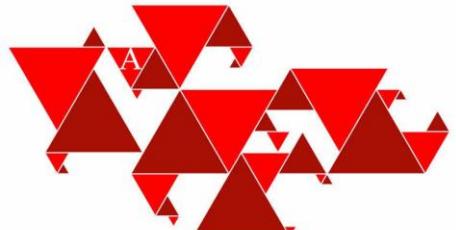
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Partial view of Torre dos Clérigos

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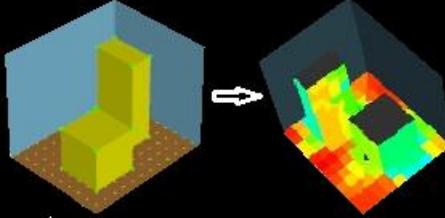
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4



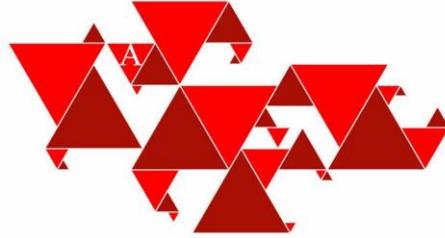
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Views from Torre dos Clérigos

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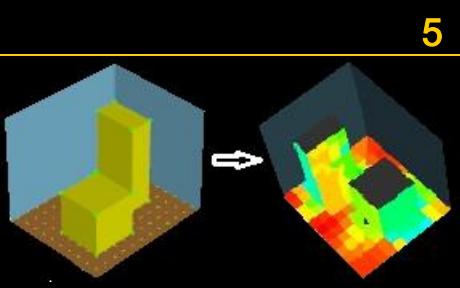
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ANTONIO CORREIA

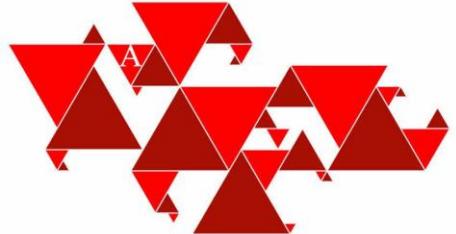


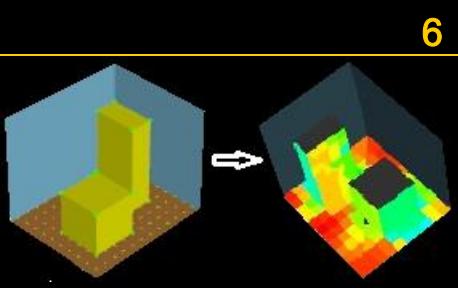
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Serralves

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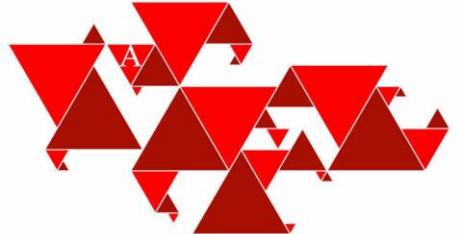


6

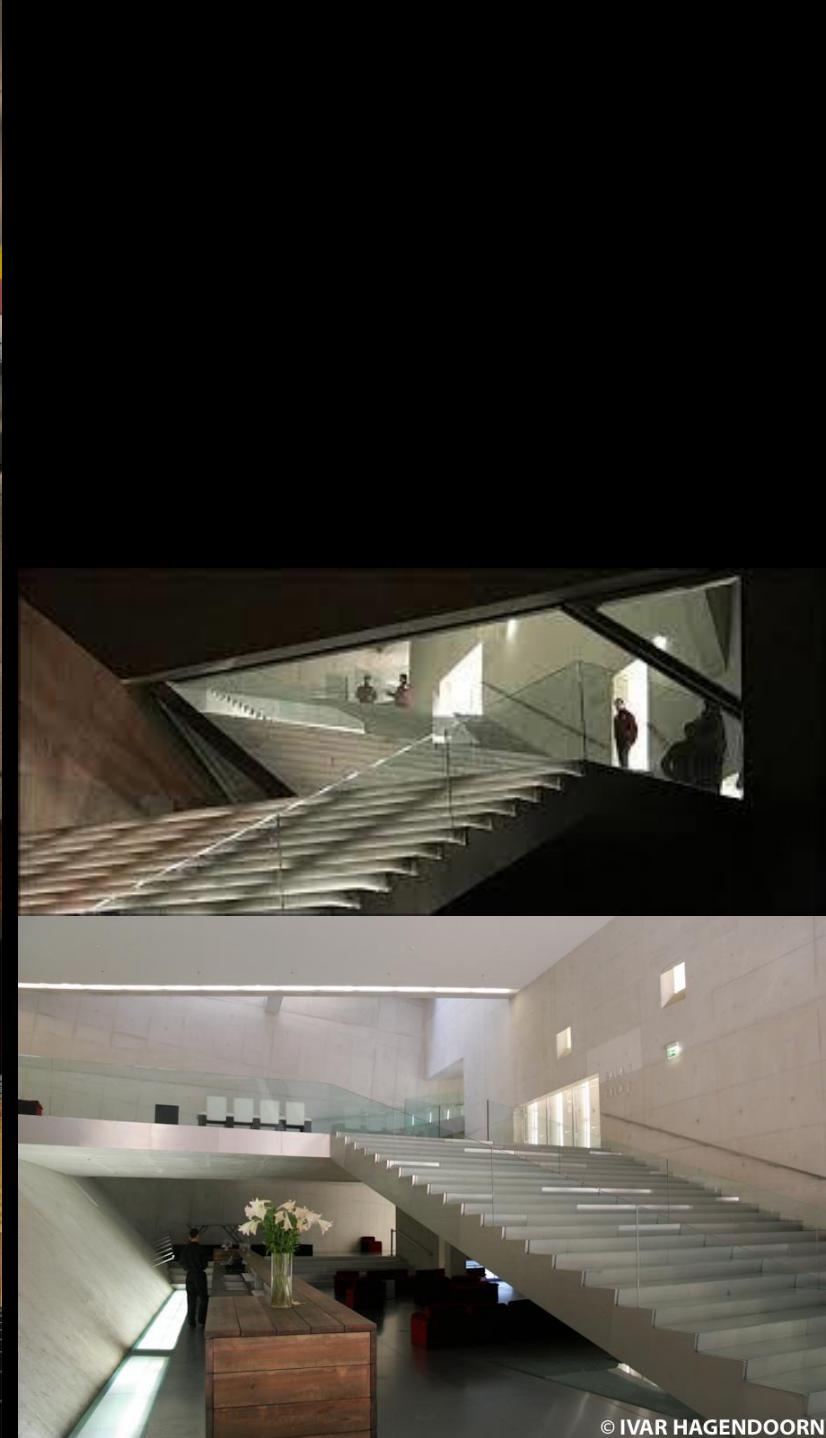
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Casa da Música

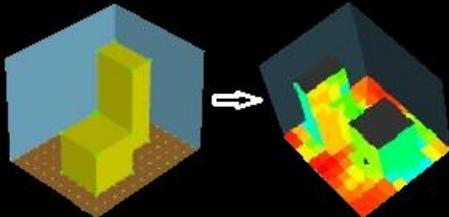
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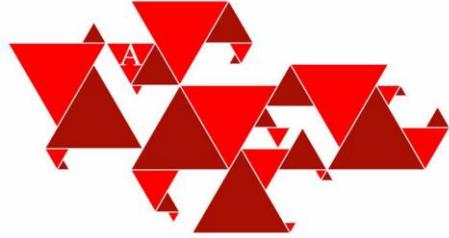


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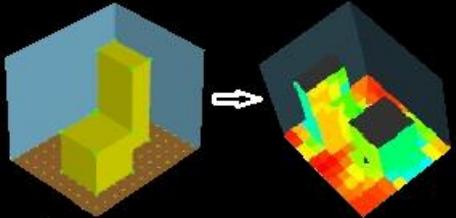


Torre dos Clérigos interiors

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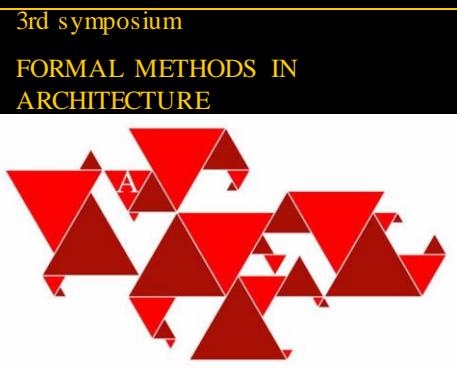


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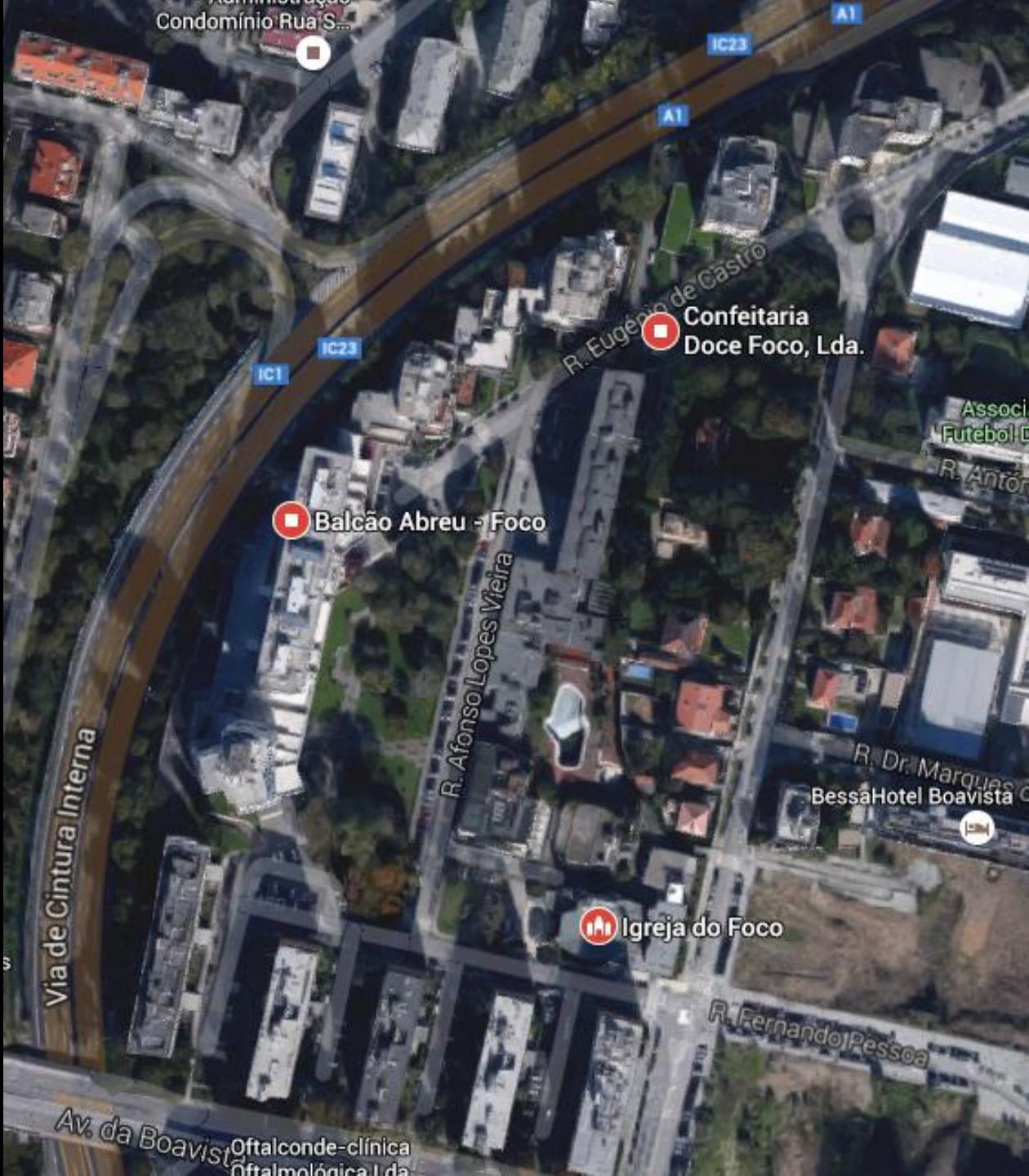


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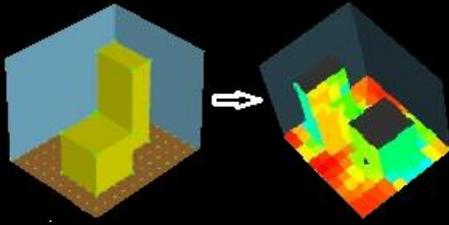
Foco



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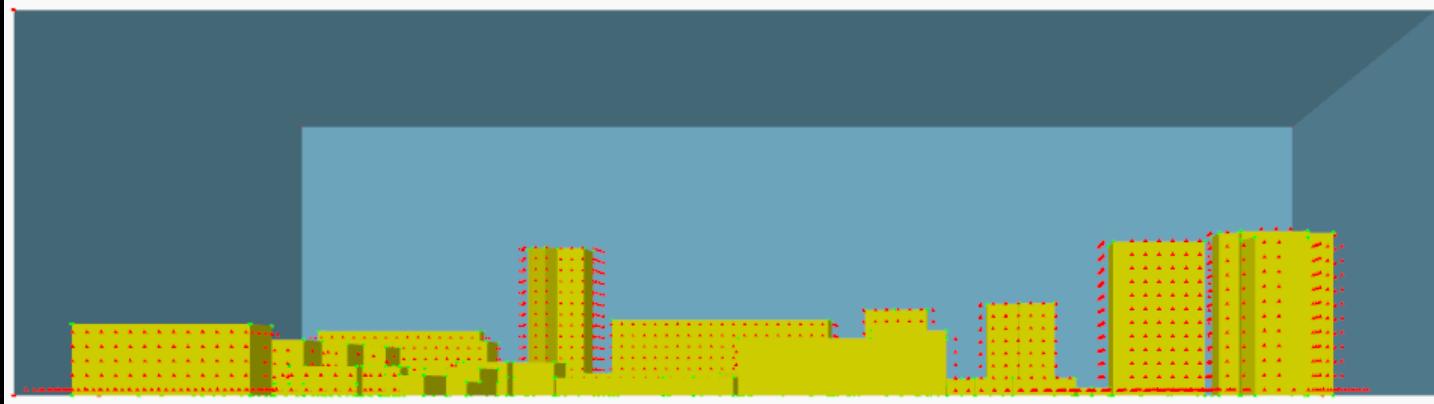
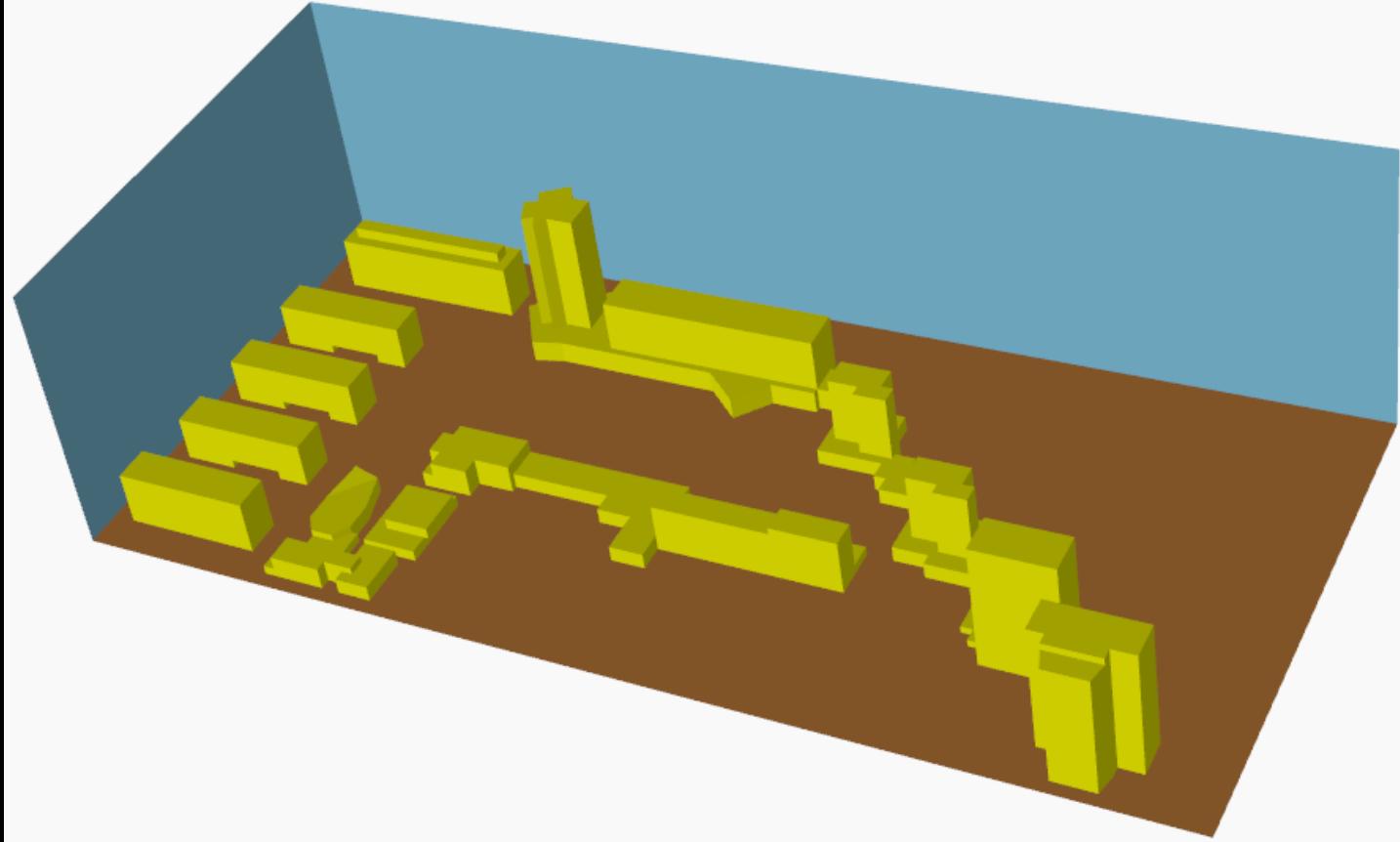
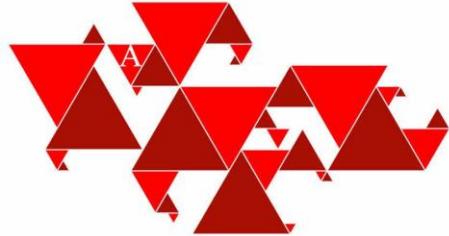


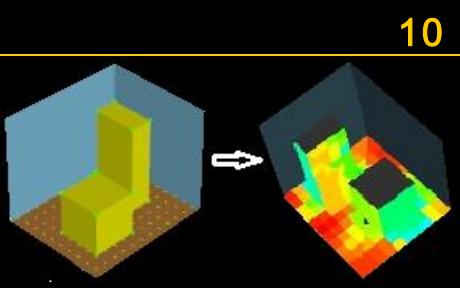
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Foco model

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10

VisibilityFunction (Point1(x1,y1,z1), Point2(x2,y2,z2)) = Yes or No

DepthSpace3D:

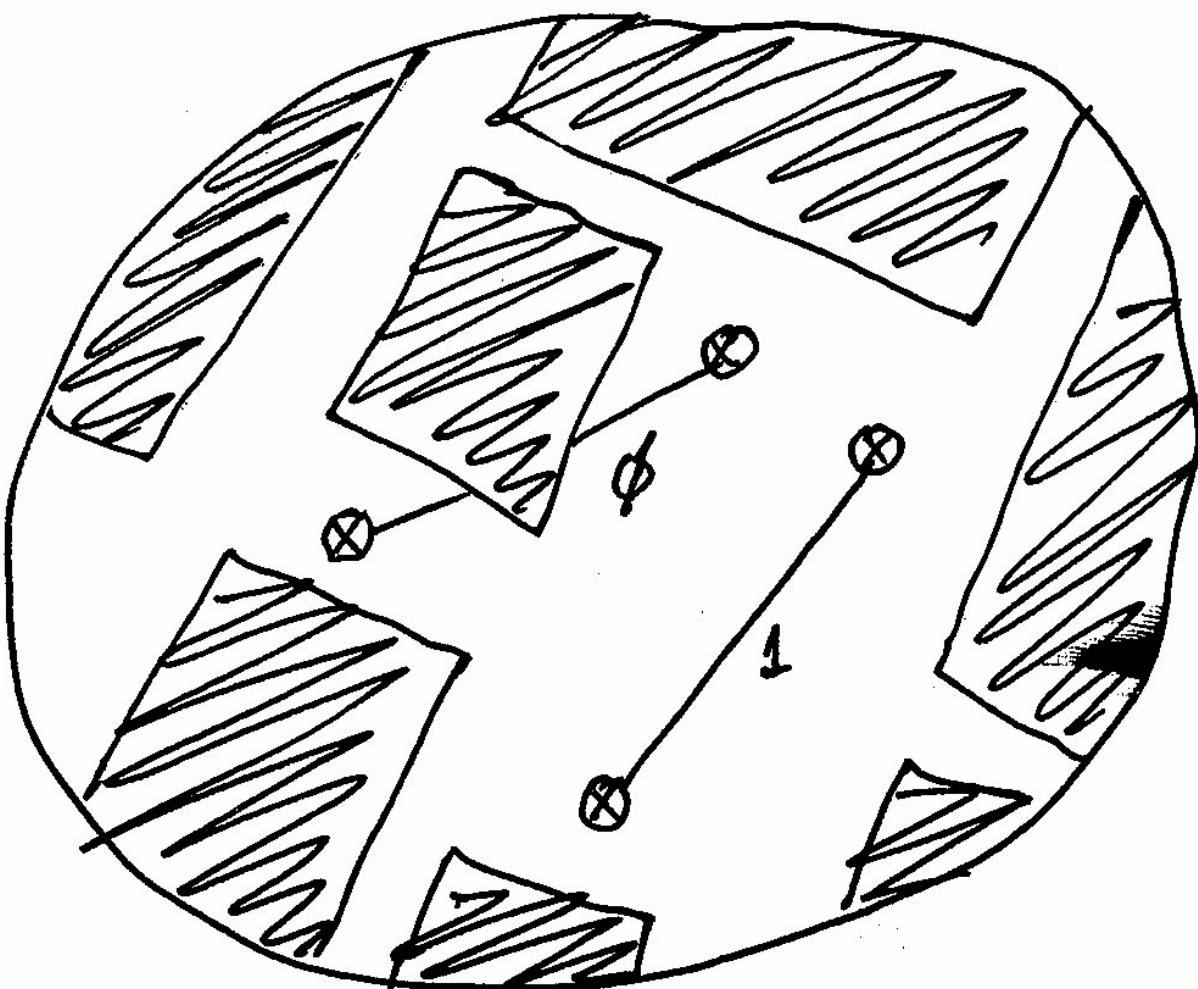
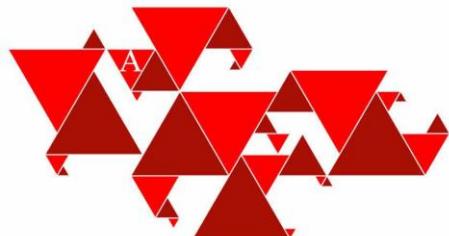
a new digital tool for 3D
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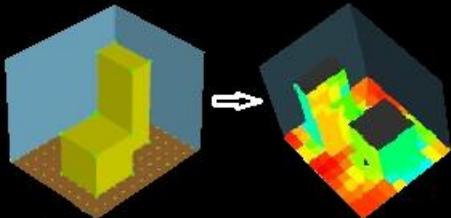
Franklin Morais

2D visibility analysis

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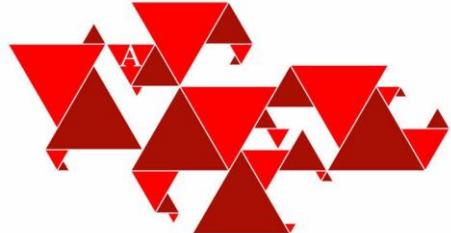
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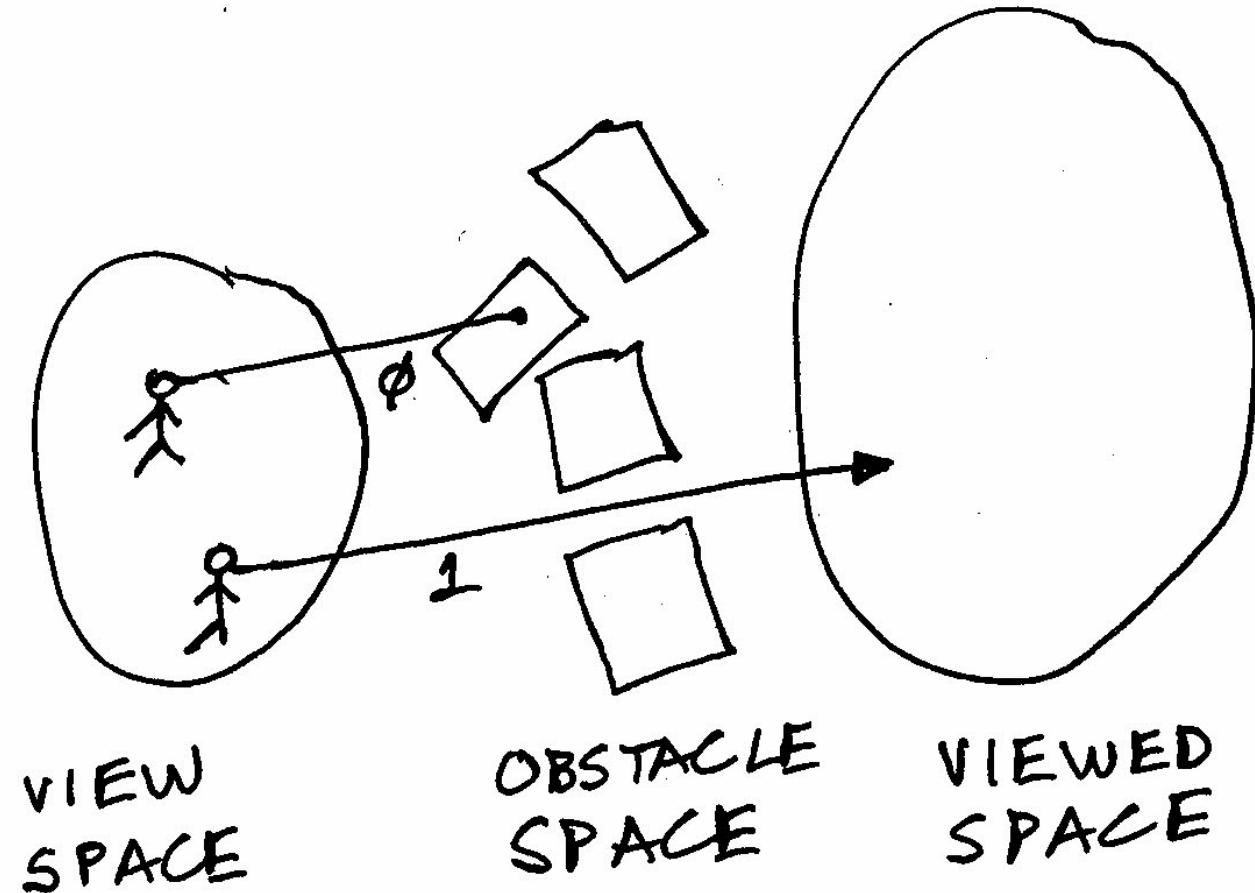
3D visibility analysis

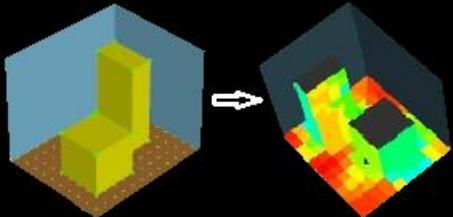
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VisibilityFunction(ViewPoint(x1,y1,z1), ViewedPoint(x2,y2,z2)) = Yes or No



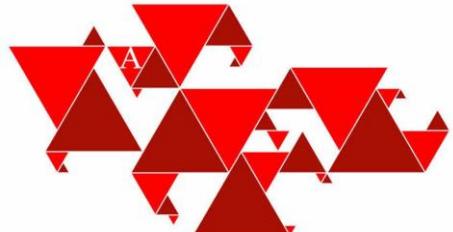


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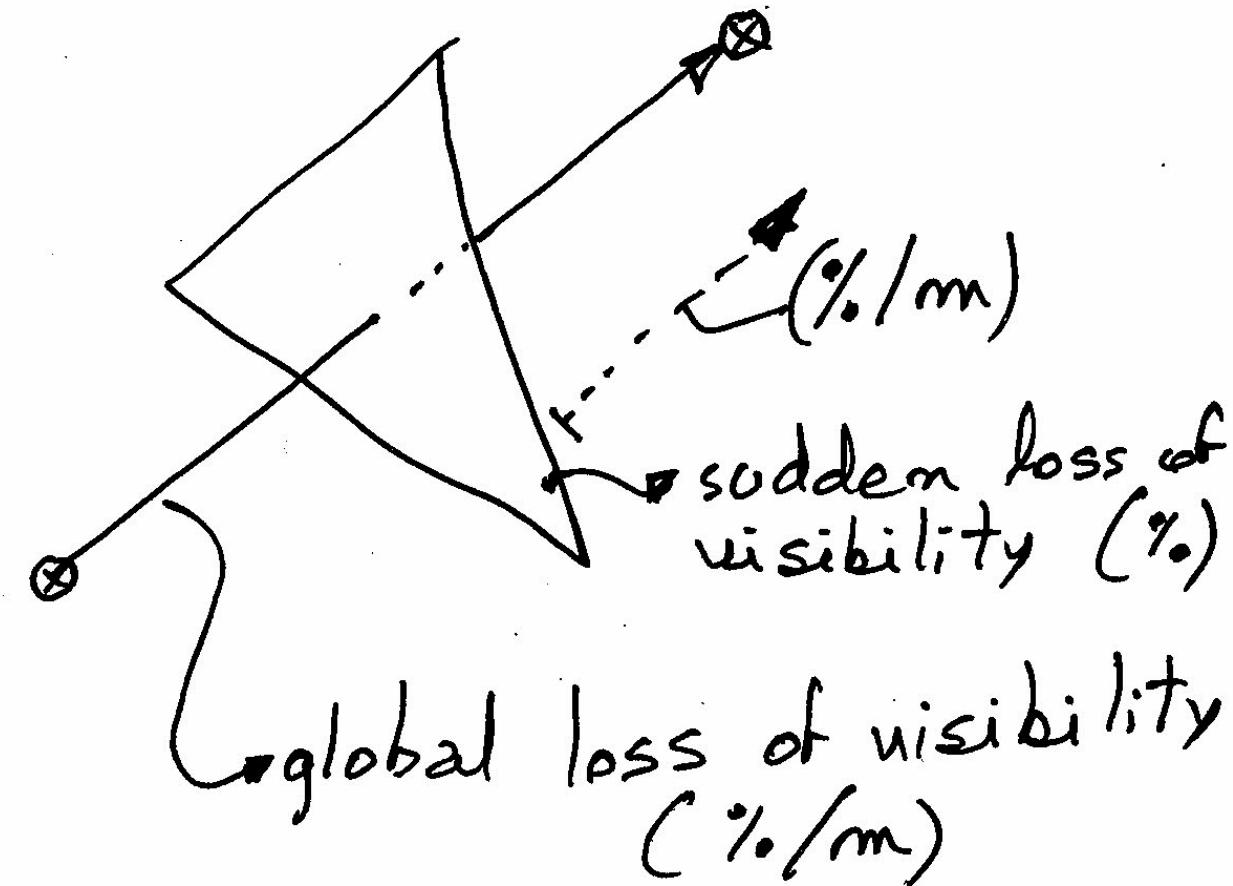
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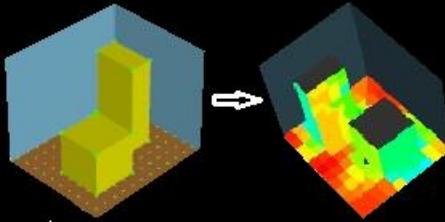
Transparency / opacity

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VisibilityFunction (ViewPoint(x1,y1,z1), ViewedPoint(x2,y2,z2)) = 0 to 1



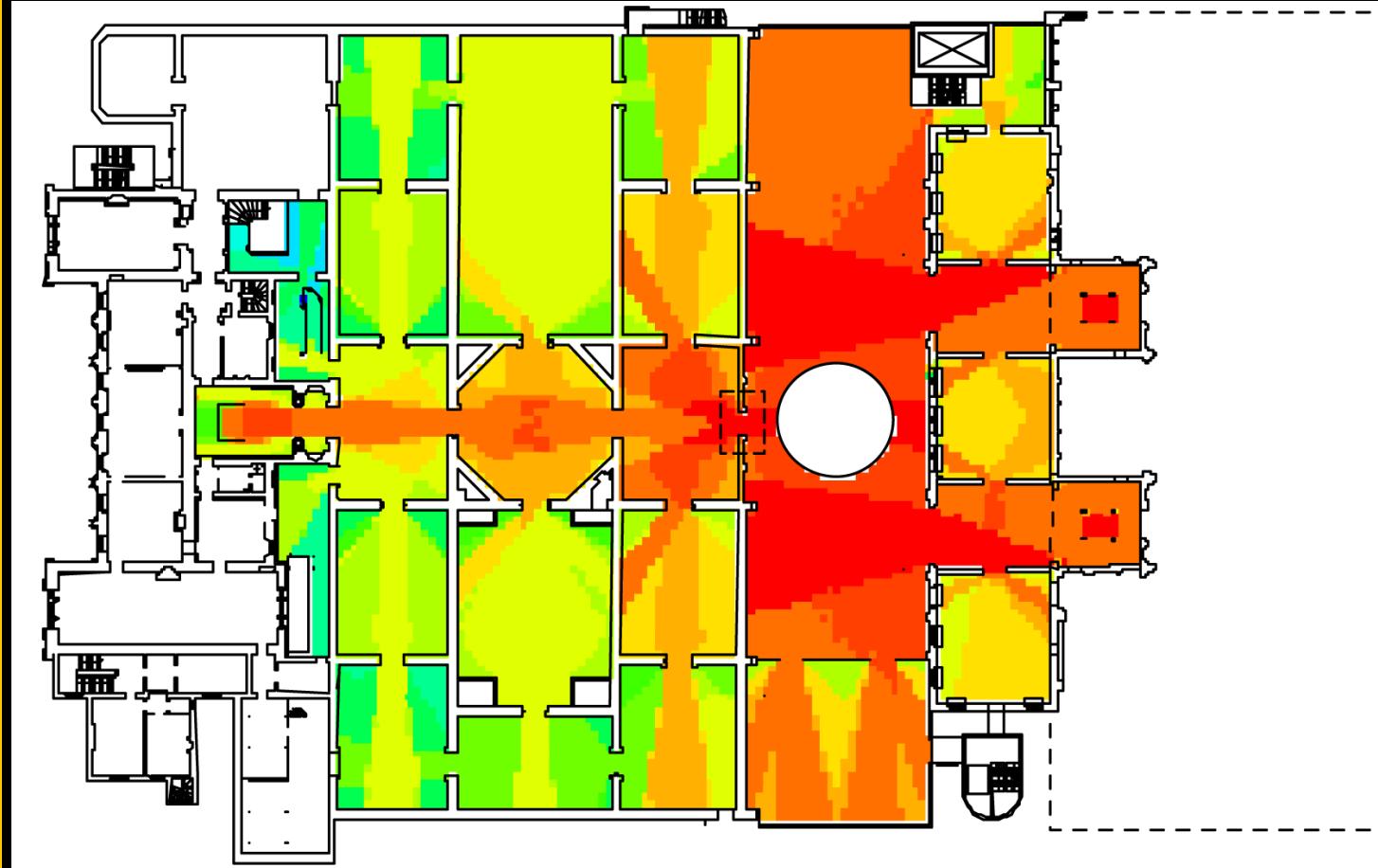
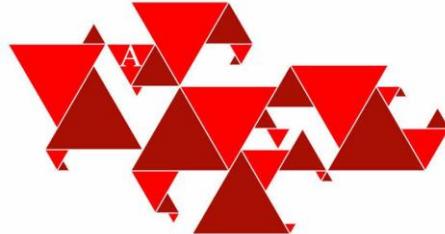


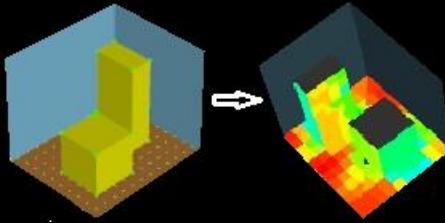
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2D visibility analysis

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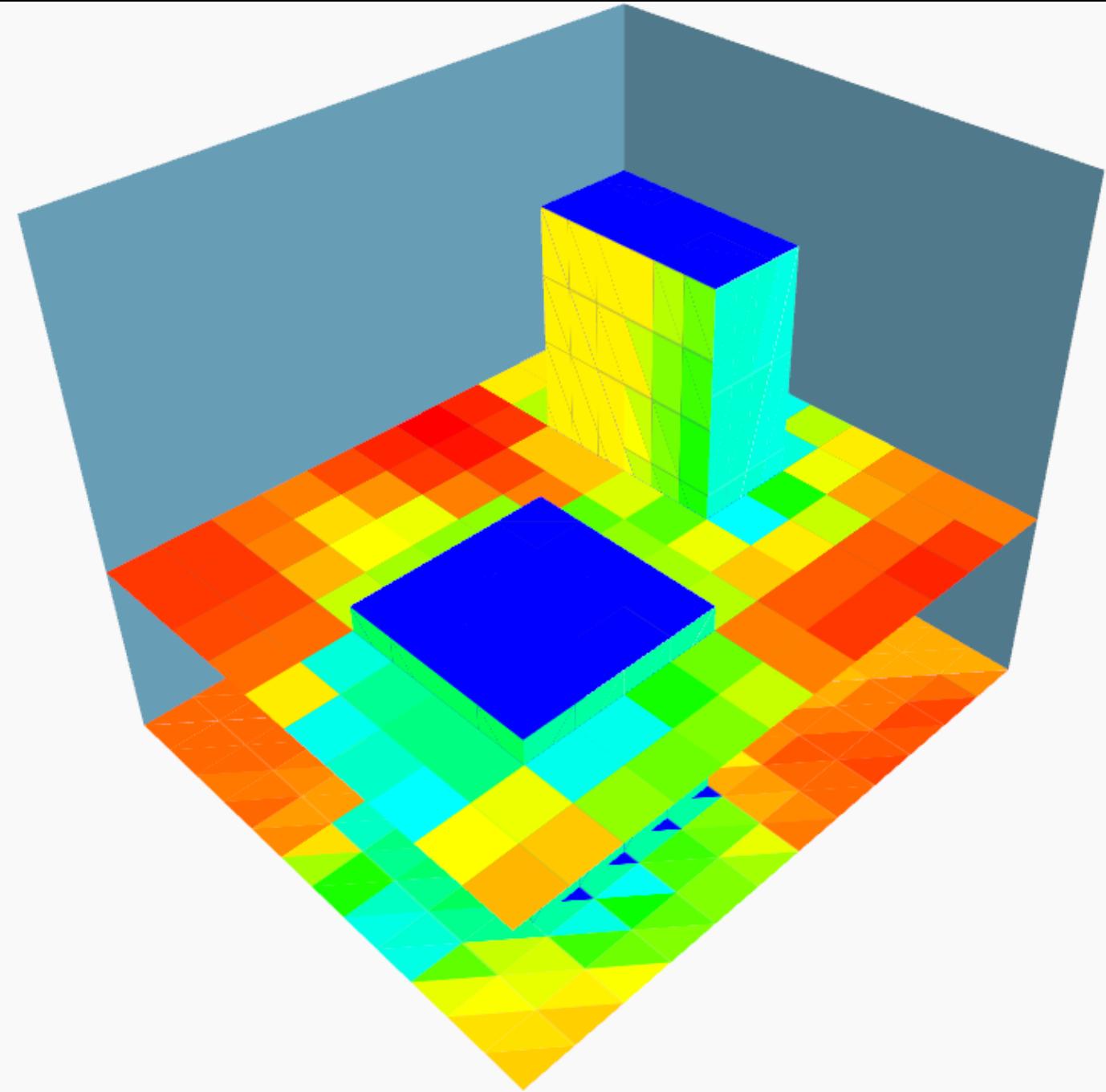
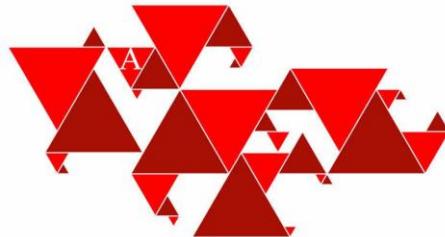


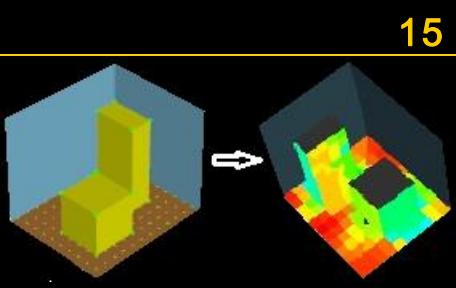


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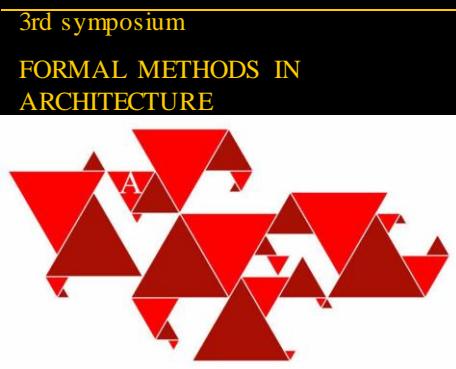




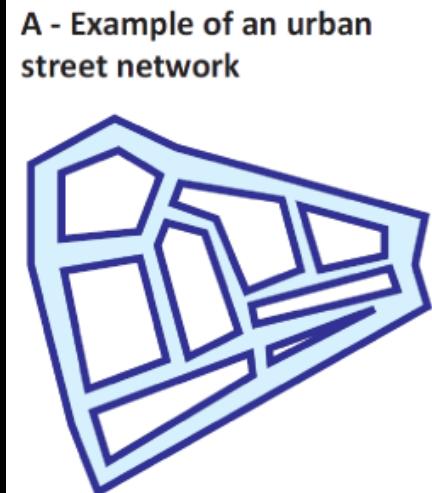
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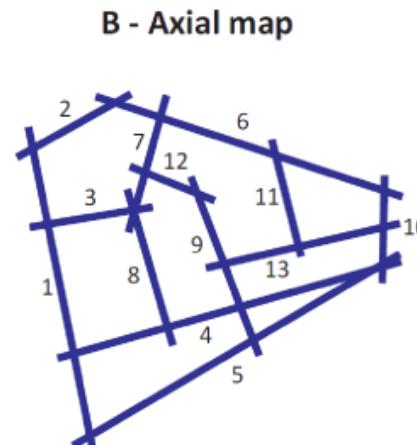
3 topological representations



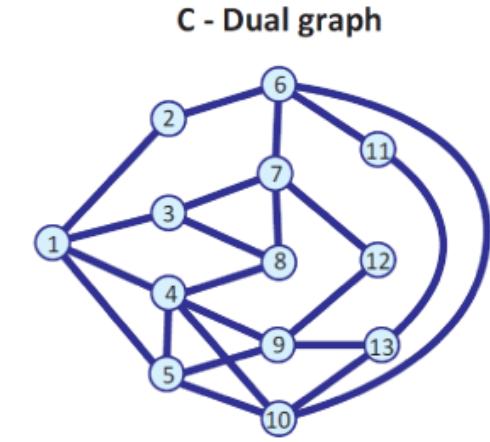
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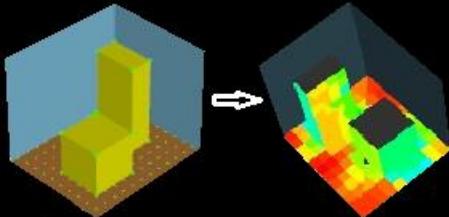
A - Example of an urban
street network



B - Axial map



C - Dual graph

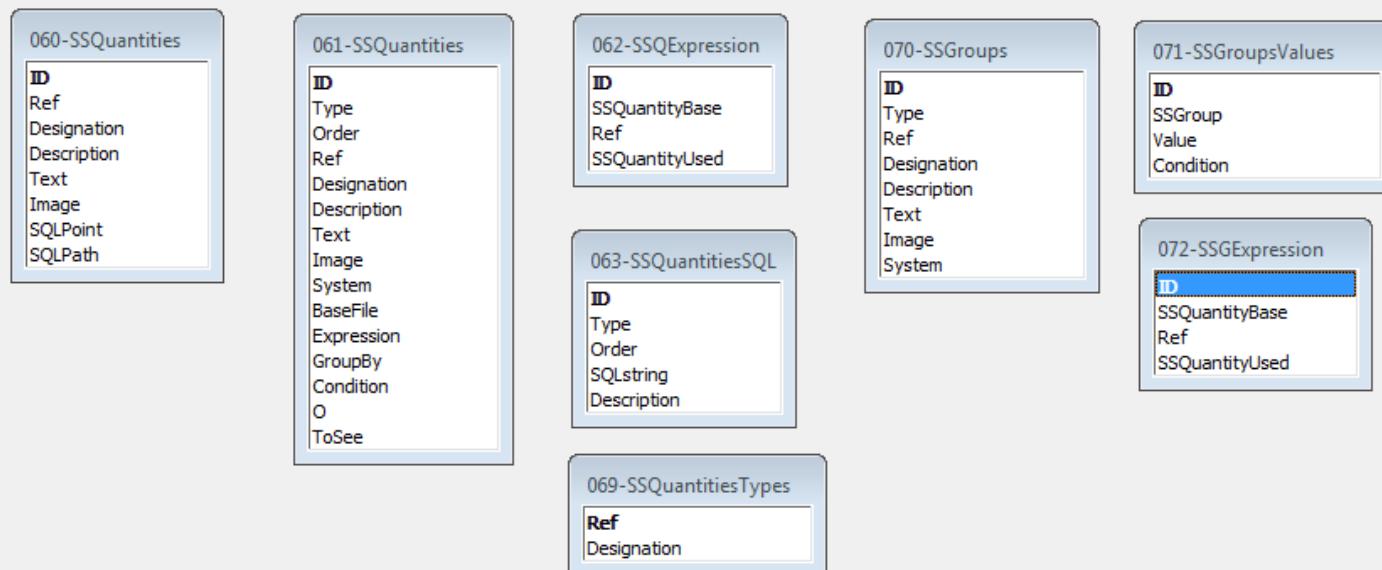
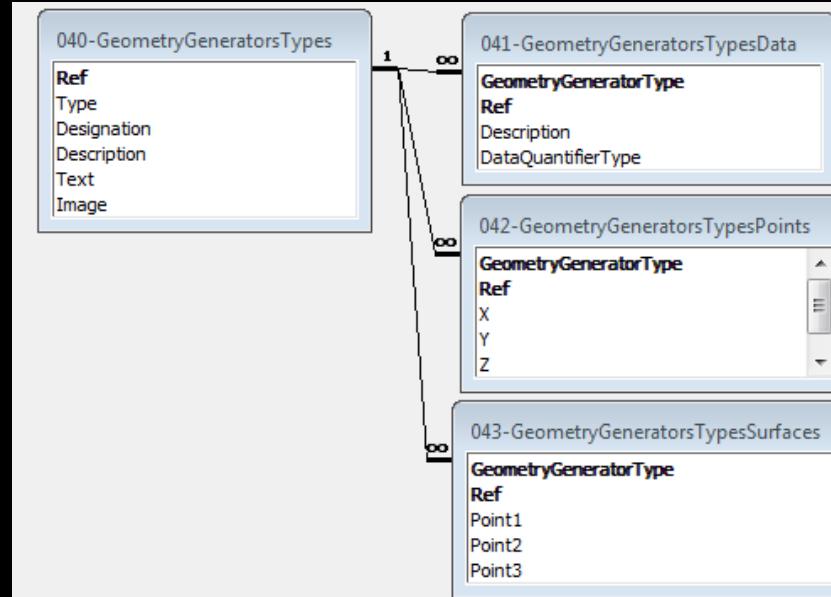
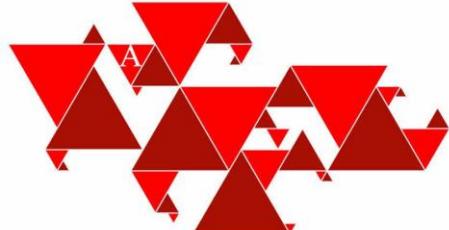


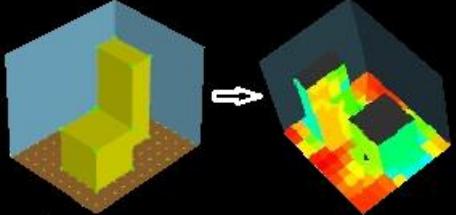
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DepthSpace3D Database 1

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DepthSpace3D:

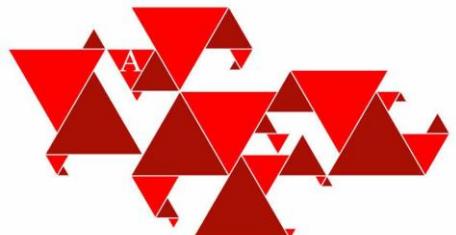
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DepthSpace3D Database 2

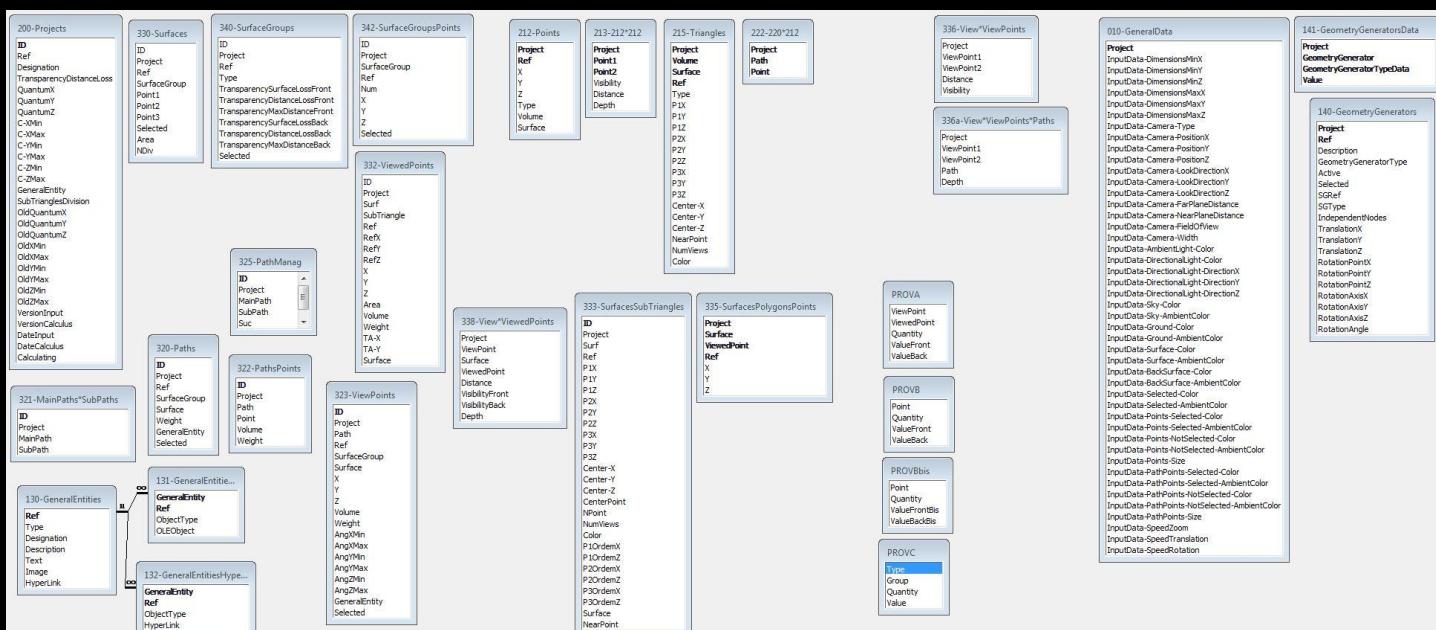
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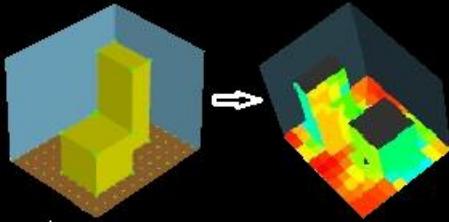
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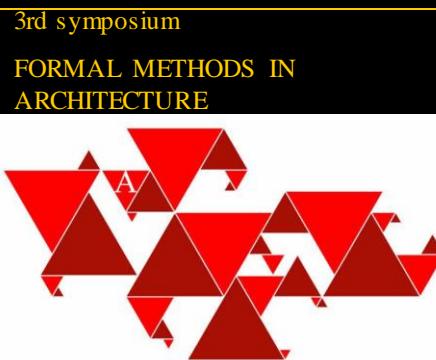
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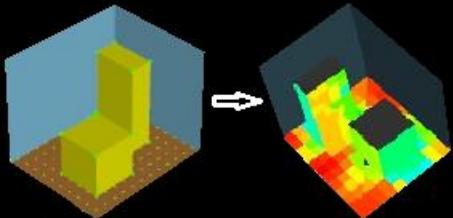
SQL query definition of Isovista



```

UPDATE PROVB INNER JOIN [337-
View*ViewedPoints] ON PROVB.Point
= [337-
View*ViewedPoints].ViewedPoint SET
PROVB.ValueFront = [VisibilityFront],
PROVB.ValueBack = [VisibilityBack]
WHERE ((([337-
View*ViewedPoints].ViewPoint)=#PP#))
;

```

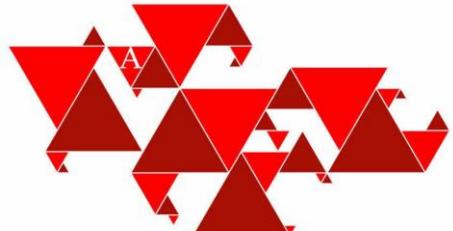


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SQL query definition of Isovista

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Consulta8 : Consulta Actualização

```

    graph LR
        PROVB["PROVB  
*  
Point  
Quantity  
ValueFront  
ValueBack"] ---> ViewedPoints["337-View*ViewedPoints  
*  
ID  
Project  
ViewPoint  
Surface  
ViewedPoint  
Distance  
VisibilityFront  
VisibilityBack  
Depth"]
    
```

Campo:	ValueFront	ValueBack	ViewPoint
Tabela:	PROVB	PROVB	337-View*ViewedPc
Actualizar para:	[VisibilityFront]	[VisibilityBack]	
Critério:			#PP#
ou:			

20

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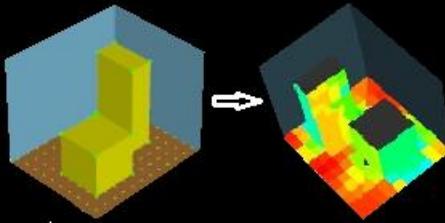
DepthSpace3D

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DepthSpace3D - Begin

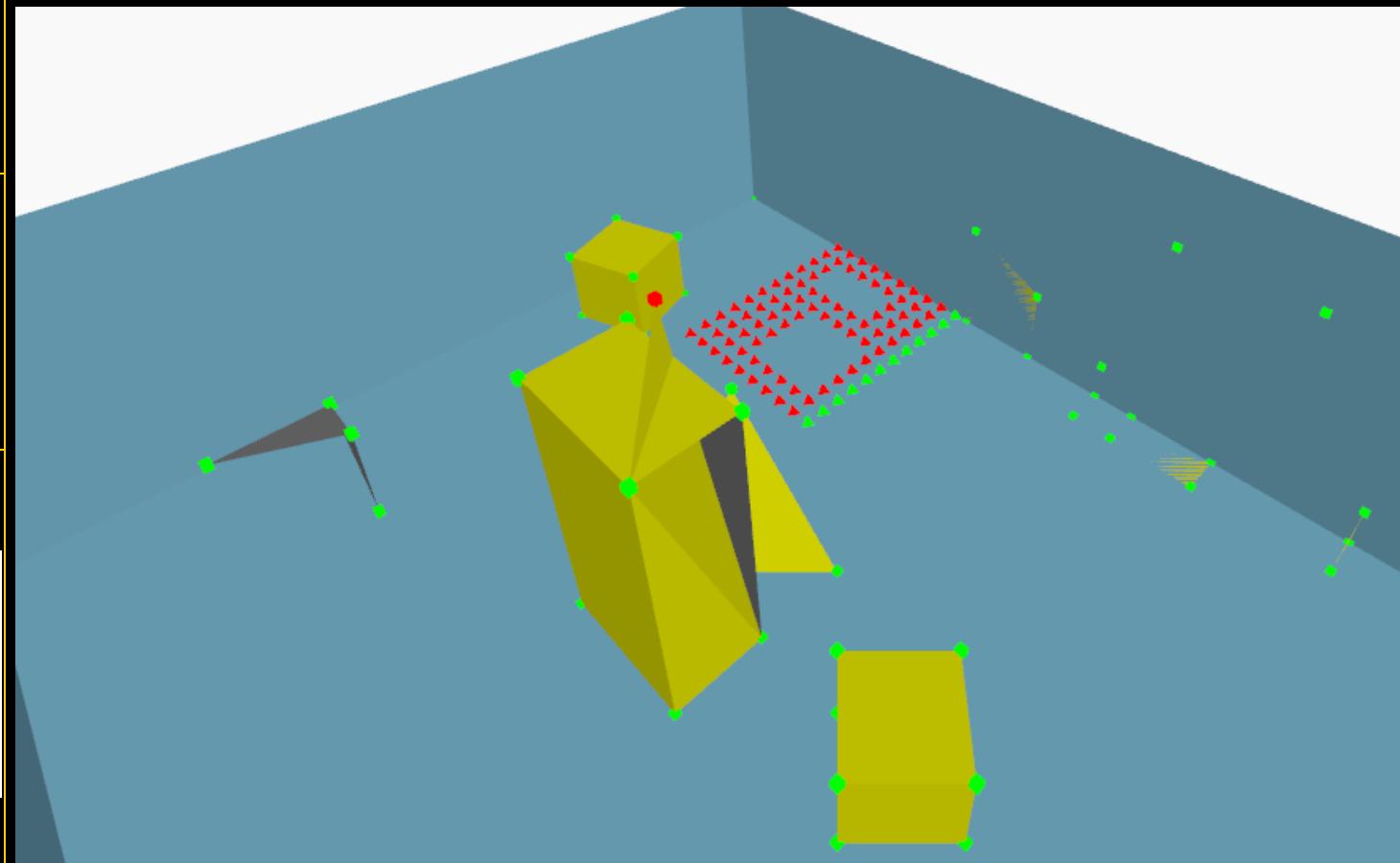
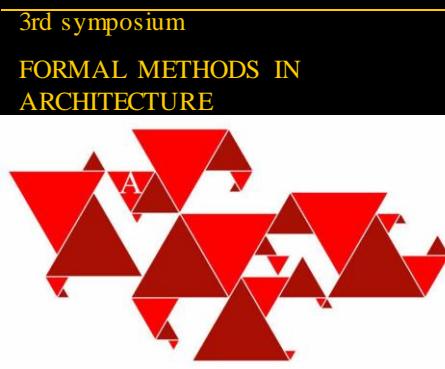
PROJECTS

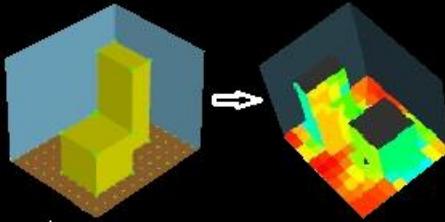
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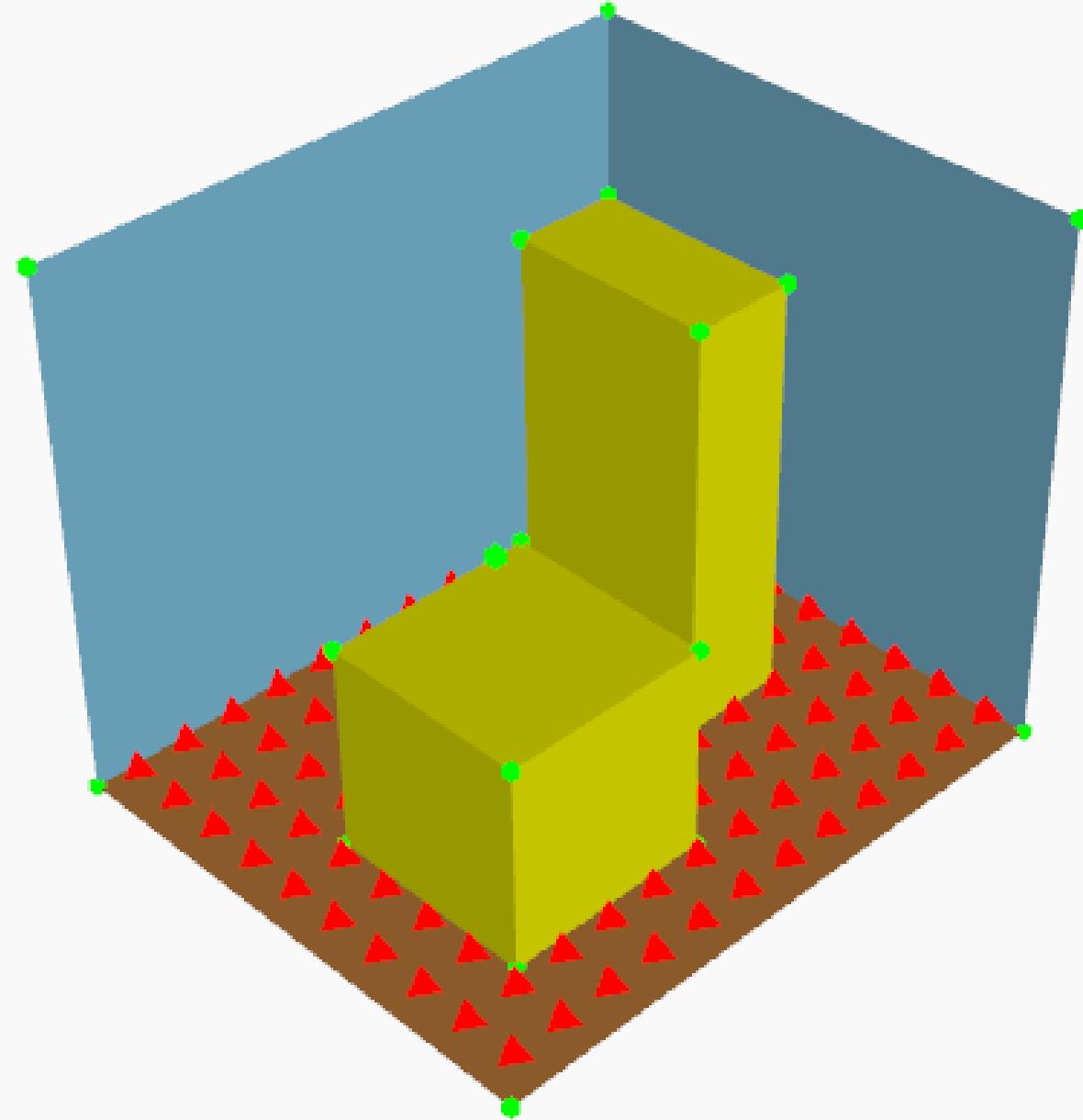
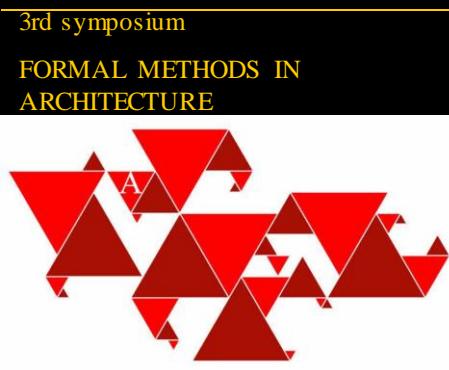
DepthSpace3D Geometry input

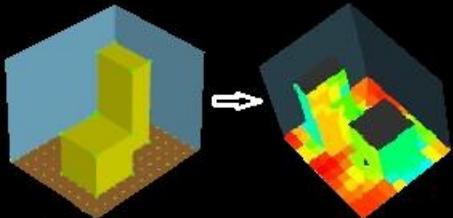




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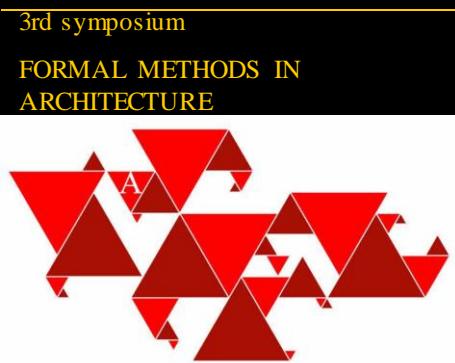
DepthSpace3D ViewPoints





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DepthSpace3D Paths



Select Path

Sel?	Ref	Weight
<input checked="" type="checkbox"/>	MainPath	1

Layout1 Layout2 Layout3 Surfaces Paths Geometry Generators

Edit current Path
Ref: MainPath Selected:

Sub-Paths of the current Path:

ID	Reference
----	-----------

add new Sub-Path

current Path is sub-path of paths:

ID	Reference
----	-----------

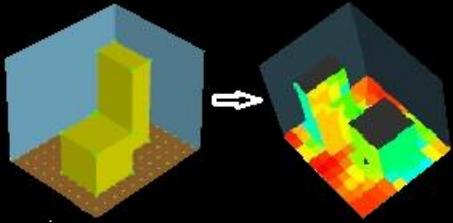
Points of the current Path (VIEW POINTS):

Sel?	Ref	X	Y	Z	Volum	Weight
<input checked="" type="checkbox"/>	1 1 1	2.5	2.5	2.5	0	0
<input checked="" type="checkbox"/>	1 1 0 1	2.5	2.5	47.5	0	0
<input checked="" type="checkbox"/>	1 1 1 1	2.5	2.5	52.5	0	0
<input checked="" type="checkbox"/>	1 1 2 1	2.5	2.5	57.5	0	0
<input checked="" type="checkbox"/>	1 2 1	2.5	2.5	7.5	0	0
<input checked="" type="checkbox"/>	1 3 1	2.5	2.5	12.5	0	0
<input checked="" type="checkbox"/>	1 4 1	2.5	2.5	17.5	0	0
<input checked="" type="checkbox"/>	1 5 1	2.5	2.5	22.5	0	0
<input checked="" type="checkbox"/>	1 6 1	2.5	2.5	27.5	0	0
<input checked="" type="checkbox"/>	1 7 1	2.5	2.5	32.5	0	0

Change coordinates of selected Points
X: Y: Z: Angle(°):

Rotation - Point:
Rotation - Axis:

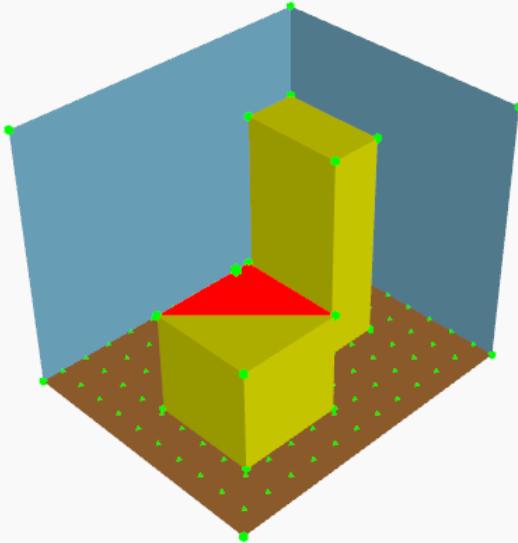
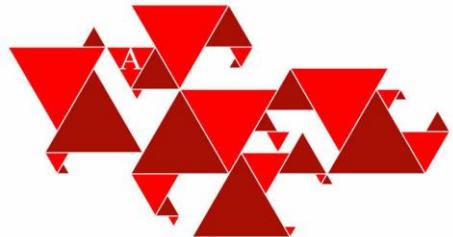
Translation:



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DepthSpace3D Surface Viewed Points

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Layout1 Layout2 Surfaces Paths Geometry Generators

Select Surface Groups

Sel?	Type	Ref
<input checked="" type="checkbox"/>	Buildings	Building01
<input type="checkbox"/>	Buildings	Building02
<input type="checkbox"/>	Ground	Ground
<input type="checkbox"/>	Sky	Sky

Edit current Surface Group

Ref: Building01 Selected:

Type: Transparency Surface Loss Front: 23

Change Properties of Selected Surface Groups

Type: Transparency Surface Loss Front:

Points

ID	Sel?	X	Y	Z
185	<input type="checkbox"/>	20	0	30
186	<input type="checkbox"/>	40	0	30
187	<input type="checkbox"/>	20	0	50
188	<input type="checkbox"/>	40	0	50
189	<input type="checkbox"/>	20	20	30
190	<input type="checkbox"/>	40	20	30
191	<input type="checkbox"/>	20	20	50
192	<input type="checkbox"/>	40	20	50

Change coordinates of Selected Points

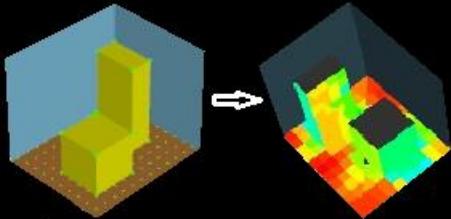
X:	Y:	Z:	Angle(°):

Rotation - Point: Rotation - Axis: Translation:

Surfaces

Sel?	Ref	Point 1	Point 2	Point 3
<input type="checkbox"/>	B01-Bottom1	185	186	187
<input type="checkbox"/>	B01-Bottom2	186	188	187
<input type="checkbox"/>	B01-FacadeA1	186	190	188
<input type="checkbox"/>	B01-FacadeA2	188	190	192
<input type="checkbox"/>	B01-FacadeB1	185	189	186
<input type="checkbox"/>	B01-FacadeB2	186	189	190
<input type="checkbox"/>	B01-FacadeC1	185	187	189
<input type="checkbox"/>	B01-FacadeC2	187	191	189
<input type="checkbox"/>	B01-FacadeD1	187	188	191
<input type="checkbox"/>	B01-FacadeD2	188	192	191

25



DepthSpace3D:

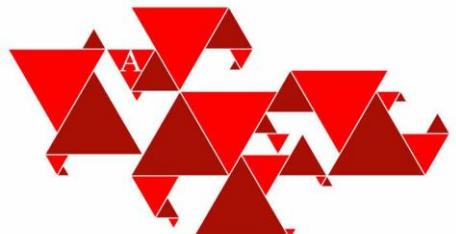
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DepthSpace3D Geometry generators

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November 30, December 02 | 2015

ESAP | Escola Superior Artística do Porto

New Geometry Generator

Choose Type of new Geometry Generator and

P01 parallelepiped parallel to axis

Choose recorded Geometry Generator

Sel?	Ref	Description	Act?
------	-----	-------------	------

: go to of 0

Order by: Ref Description

Edit current Geometry Generator

Ref: Active: Selected: Independent Nodes:

Geometry Generator Type:

Description:

Surface Group: Building

Type of Surface Group:

Transformation of coordinates

X:	Y:	Z:	Angle(°):
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Rotation - Point:

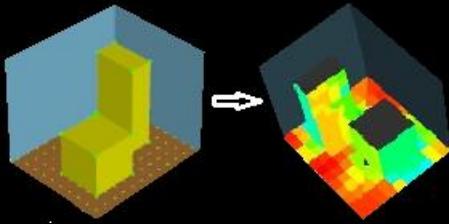
Rotation - Axis:

Translation:

Generate the Geometries -->

Geometry Generator Data

Quantity	Value



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DepthSpace3D - Projects

Project: 6 Test03 Project to Test Calculus

INPUT GEOMETRY 3D ANALYSIS 2D ANALYSIS

Layout1 Layout2 Surfaces Paths Geometry Generators

Project Dimensions

Minimum:	X: -1000	Maximum:	X: 1000
Y:	-1000	Y:	1000
Z:	-1000	Z:	1000

Recalculate with Project actual values:

Camera

Type: Perspective	Change:
Far Plane Distance: 999999	Near Plane Distance: 0.125
Field of View (Perspective): 45	Width (Orthographic): 100

Position: X: 156	Look Direction: X: -300	Point of Interest: X: -144
Y: 156	Y: -300	Y: -144
Z: 156	Z: -300	Z: -144

Distance from Camera Position to PoI: 519

Changes in: Position (Pos) affects -> Pos LD PoI

Look Direction (LD):

Point of Interest (PoI):

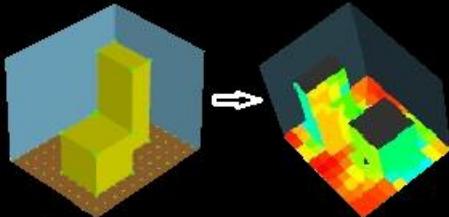
zoom1 zoom2 zoom3 translation rotation1 rotation2

100 100 100 Speed of movement

Lights

Ambient Light	Directional Light
Color: #FFFFFF	Color: #FF555555
Direction X: -30	Y: -20
Y: -20	Z: -10
Z: -10	

3D visualization of a 3D space syntax model showing a yellow central volume and blue surrounding volumes on a brown base plane.

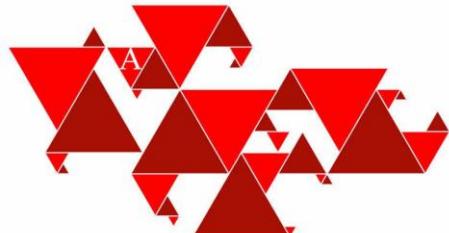


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Surfaces Colors

	Color	Ambient Color
Sky	SkyBlue	Gray
Ground	Peru	Gray
Buildings Front	Yellow	Gray
Buildings Back	Gray	Gray
Selected	Red	White

Points Colors and Size

	Color	Ambient Color
Selected	Red	White
Not Selected	Lime	White
Size	50	

Path Points Colors and Size

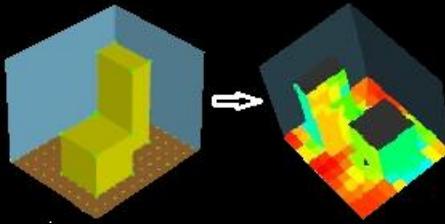
	Color	Ambient Color
Selected	Red	White
Not Selected	Lime	White
Size	50	

Hit Selection affects ...

SG S P Pa PP

.. and Propagates to:

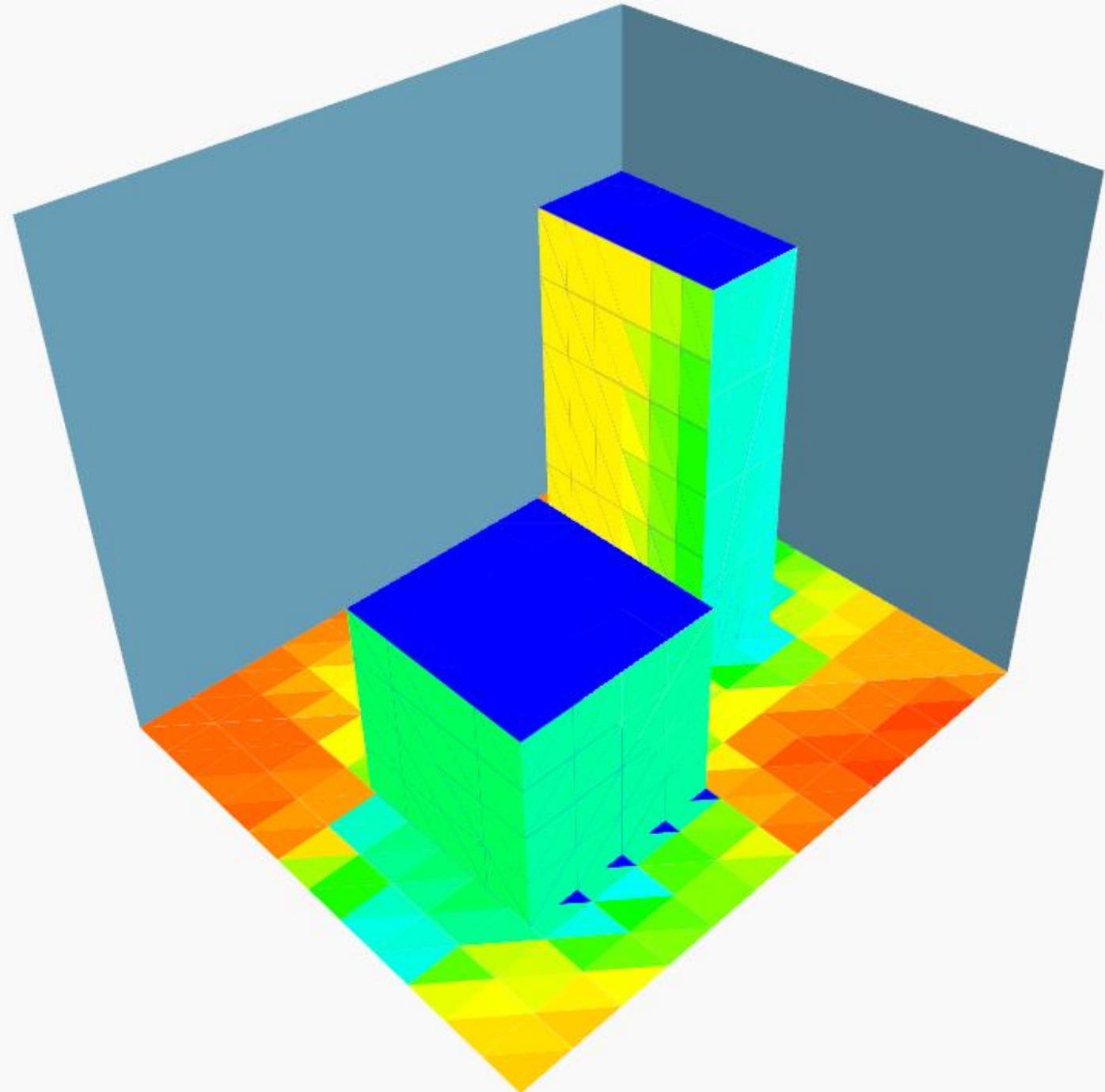
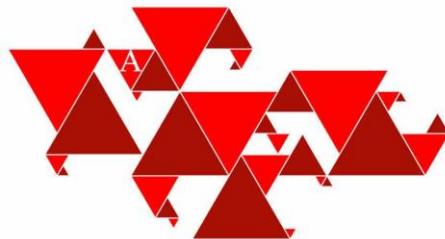
- SG - SurfaceGroups
- S - Surfaces
- P - Points
- All P of same SG w/ = {x,y,z}
- All P w/ same {x,y,z}
- Pa - Paths
- SP - Sub-Paths
- PP - Points of Paths

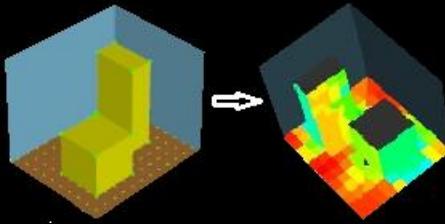


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DepthSpace3D 3D output Surfaces

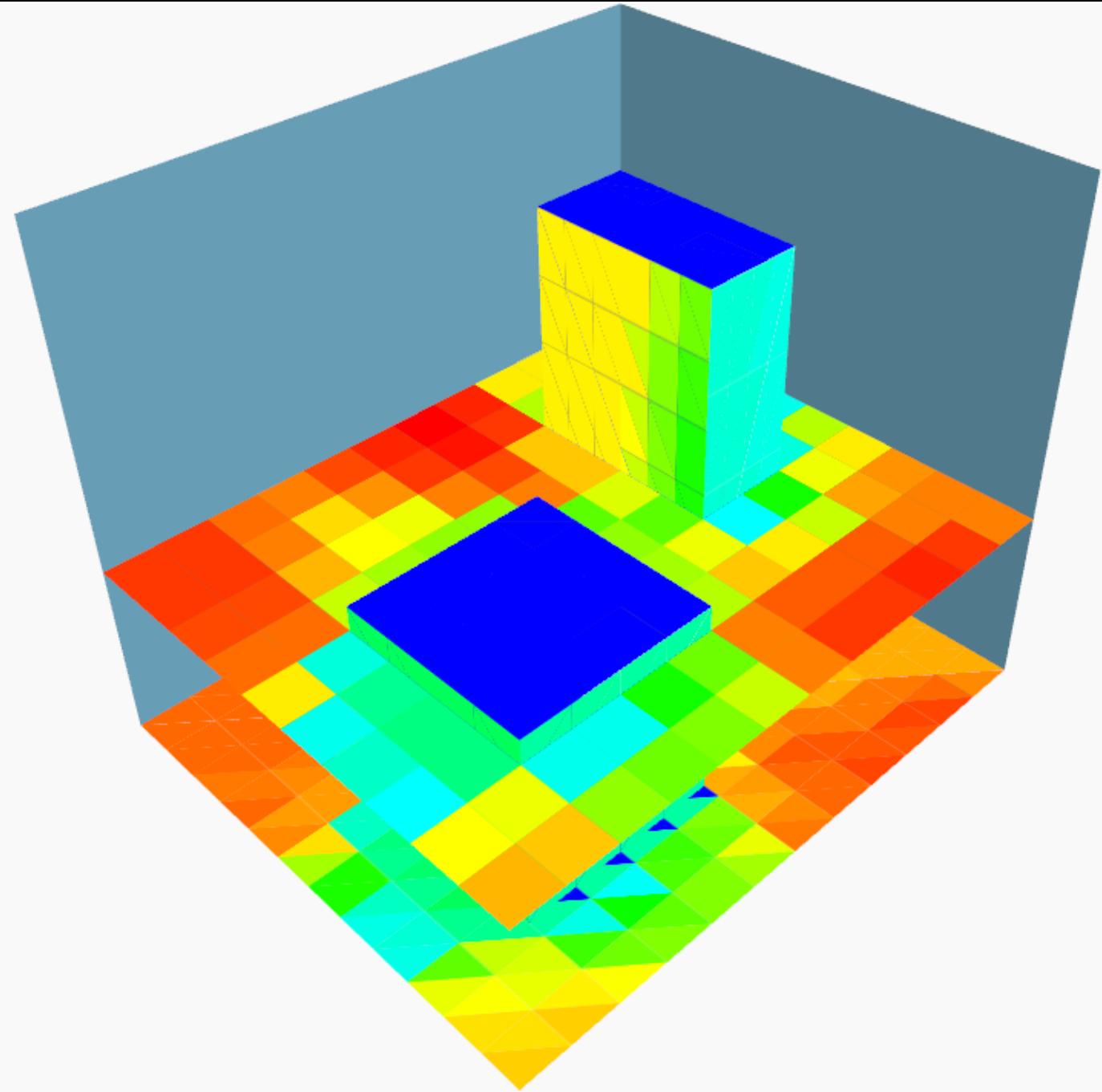
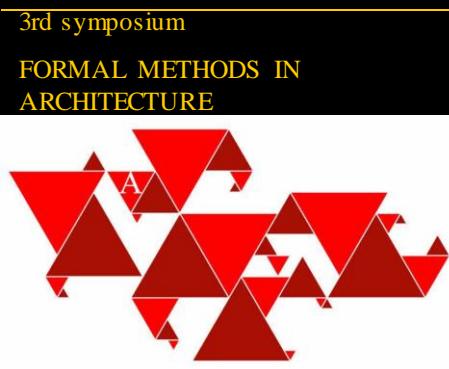
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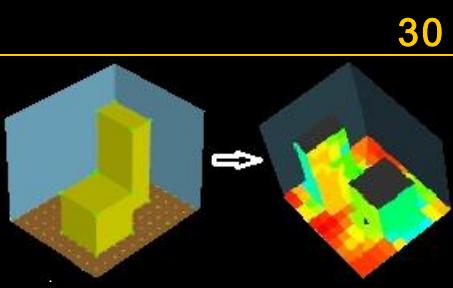




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DepthSpace3D 3D output Global Volume





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