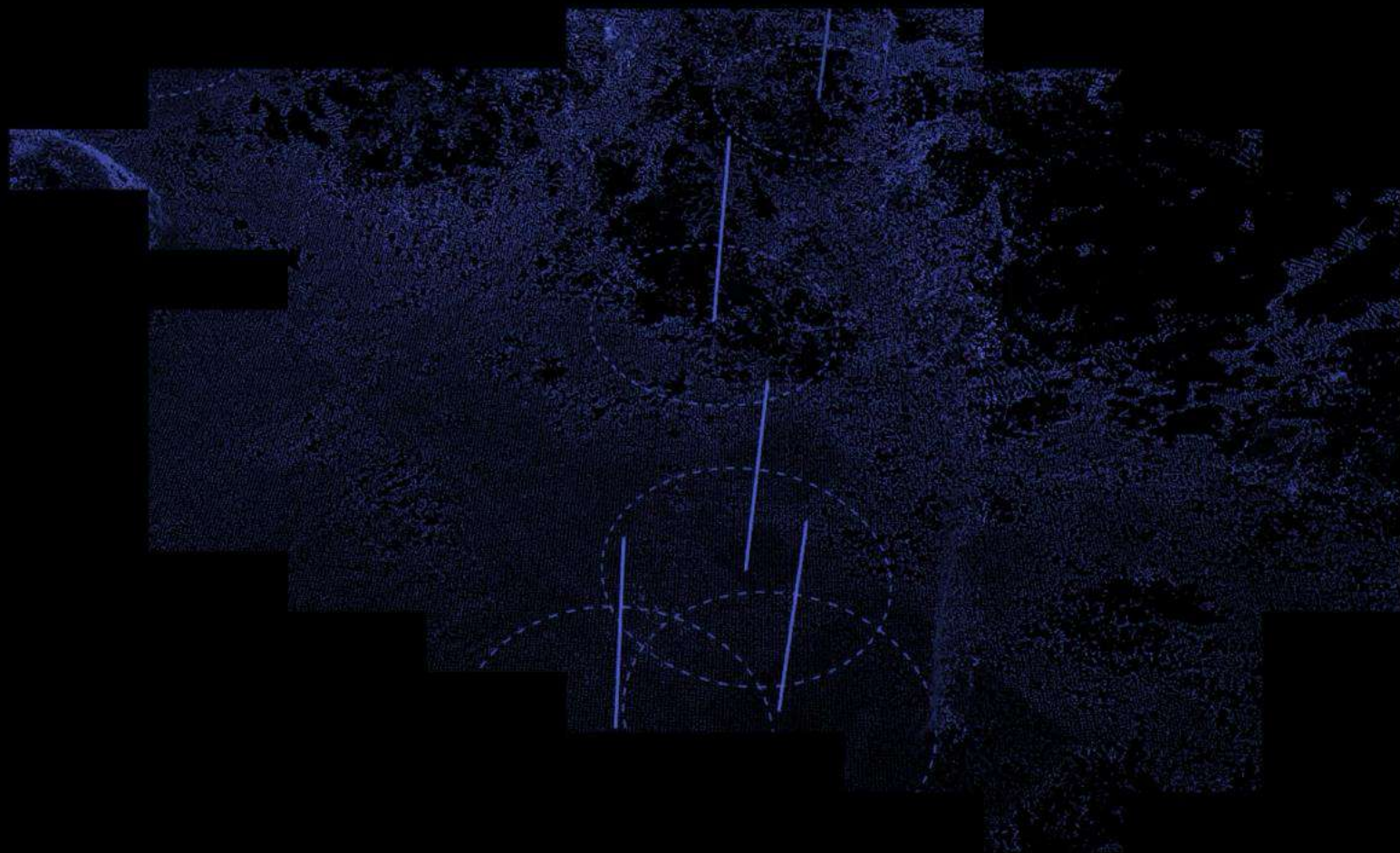
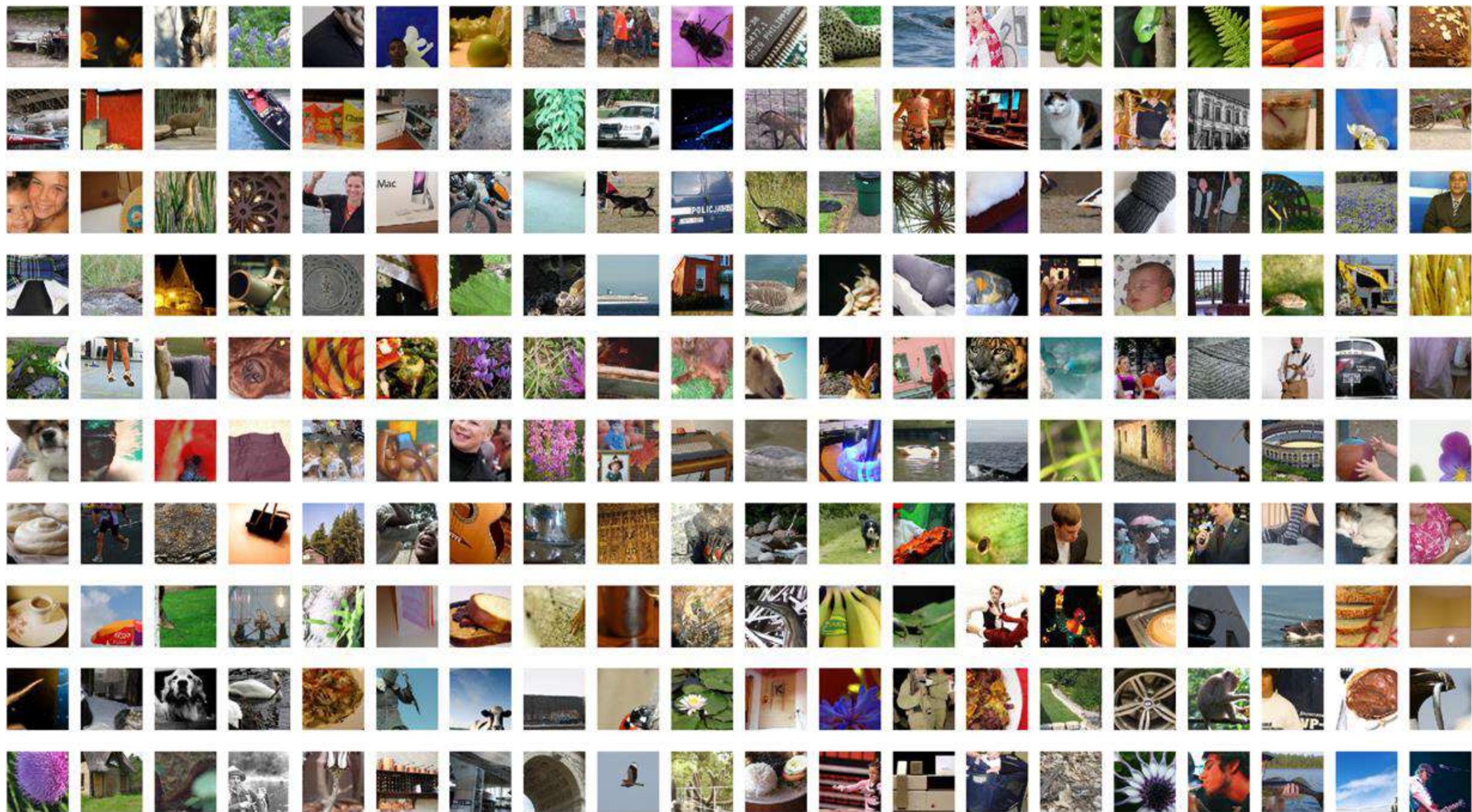


почтепа





почте



```
import numpy as np
import open3d as o3d
```

```
def vari_index_per_parcel(cloud: o3d.geometry.PointCloud, line_sets: list) → tuple[list[float], float]:
    """
```

Compute the mean VARI (Visible Atmospherically Resistant Index) per parcel
using the colors from a point cloud.

```
import numpy as np
import open3d as o3d
```

```
def vari_index_per_parcel(cloud: o3d.geometry.PointCloud, line_sets: list) → tuple[list[float], float]:
    """
```

Compute the mean VARI (Visible Atmospherically Resistant Index) per parcel
using the colors from a point cloud.

Args:

cloud (o3d.geometry.PointCloud): Open3D PointCloud object with colors in RGB [0,1].
line_sets (list): List of cubes/bounding boxes defining the parcels.

Returns:

tuple[list[float], float]:

- vari_parcel: List of mean VARI values per parcel.
- mean_vari: Mean VARI across all parcels.

```
    """
```

```
    vari_parcel = []
```

line_sets:

```
# Create oriented bounding box for the parcel
bbox = o3d.geometry.OrientedBoundingBox.create_from_points(
    o3d.utility.Vector3dVector(cloud.points)
```

```
# Compute VARI across all parcels
mean_vari = np.nanmean(
    return vari_parcel, mean_vari
```

Args:

cloud (o3d.geometry.PointCloud): Open3D PointCloud object with colors in RGB [0,1].
line_sets (list): List of cubes/bounding boxes defining the parcels.

Returns:

tuple[list[float], float]:

- vari_parcel: List of mean VARI values per parcel.
- mean_vari: Mean VARI across all parcels.

```
    """
```

```
    vari_parcel = []
```

Vision begins
with the eyes,

But truly takes
place in the brain.





Image: Leonardo's depiction of the cavities of the brain

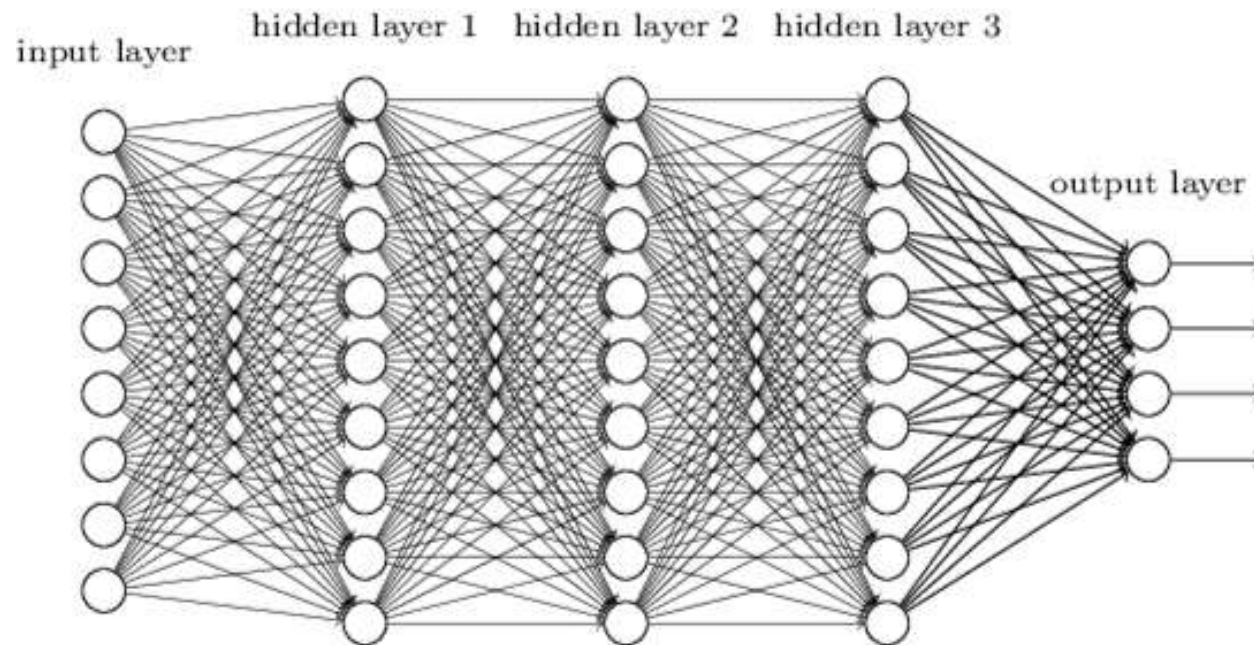


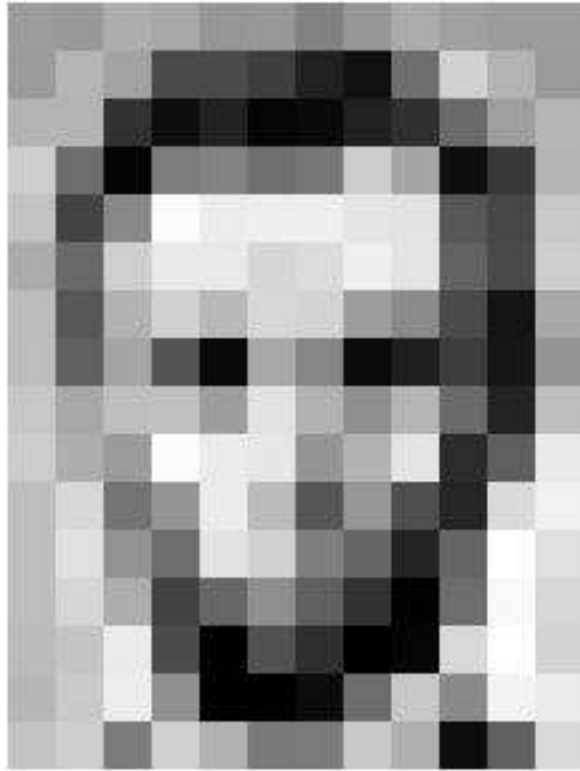
Image Credits: Representation of consciousness Robert Fludd. 1700





Deep neural network



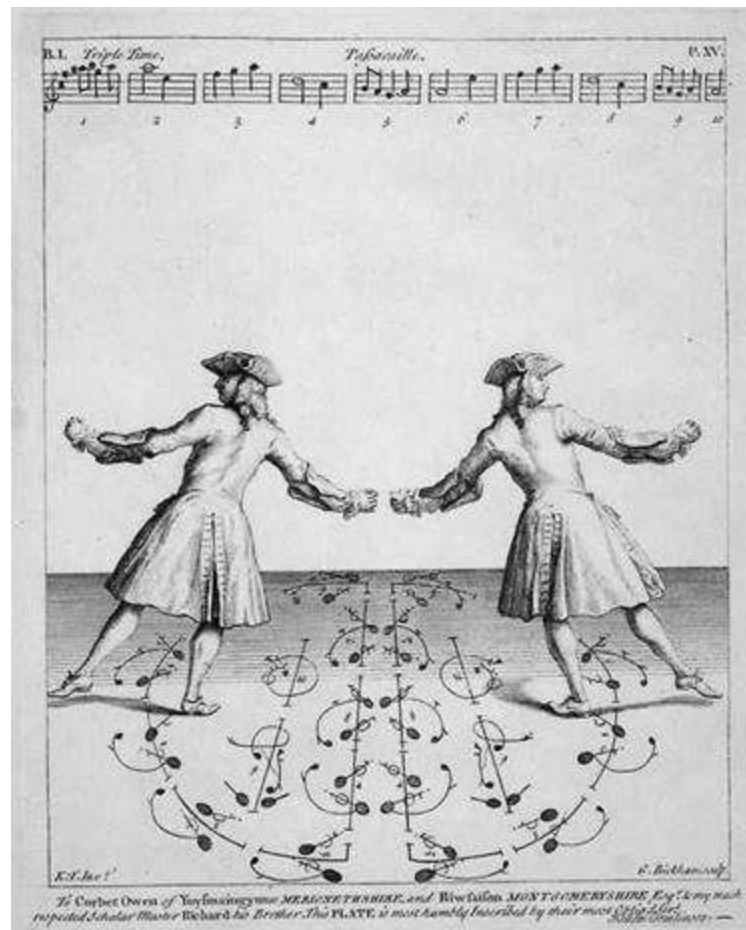


157	153	174	168	150	152	129	151	172	161	155	156
155	182	163	74	75	62	33	17	110	210	180	154
180	180	50	14	34	6	10	33	48	106	159	181
206	109	5	124	131	111	120	204	166	15	56	180
194	68	137	251	237	239	239	228	227	87	71	201
172	105	207	233	233	214	220	239	228	98	74	206
188	88	179	209	185	215	211	158	139	75	20	169
189	97	165	84	10	168	134	11	31	62	22	148
199	168	191	193	158	227	178	143	182	106	36	190
205	174	155	252	236	231	149	178	228	43	95	234
190	216	116	149	236	187	86	150	79	38	218	241
190	224	147	108	227	210	127	102	36	101	255	224
190	214	173	66	103	143	96	50	2	109	249	215
187	196	235	75	1	81	47	0	6	217	255	211
183	202	237	145	0	0	12	108	200	138	243	236
195	206	123	207	177	121	123	200	175	13	96	218

157	153	174	168	150	152	129	151	172	161	155	156
155	182	163	74	75	62	33	17	110	210	180	154
180	180	50	14	34	6	10	33	48	106	159	181
206	109	5	124	131	111	120	204	166	15	56	180
194	68	137	251	237	239	239	228	227	87	71	201
172	105	207	233	233	214	220	239	228	98	74	206
188	88	179	209	185	215	211	158	139	75	20	169
189	97	165	84	10	168	134	11	31	62	22	148
199	168	191	193	158	227	178	143	182	106	36	190
205	174	155	252	236	231	149	178	228	43	95	234
190	216	116	149	236	187	86	150	79	38	218	241
190	224	147	108	227	210	127	102	36	101	255	224
190	214	173	66	103	143	96	50	2	109	249	215
187	196	235	75	1	81	47	0	6	217	255	211
183	202	237	145	0	0	12	108	200	138	243	236
195	206	123	207	177	121	123	200	175	13	96	218



Space



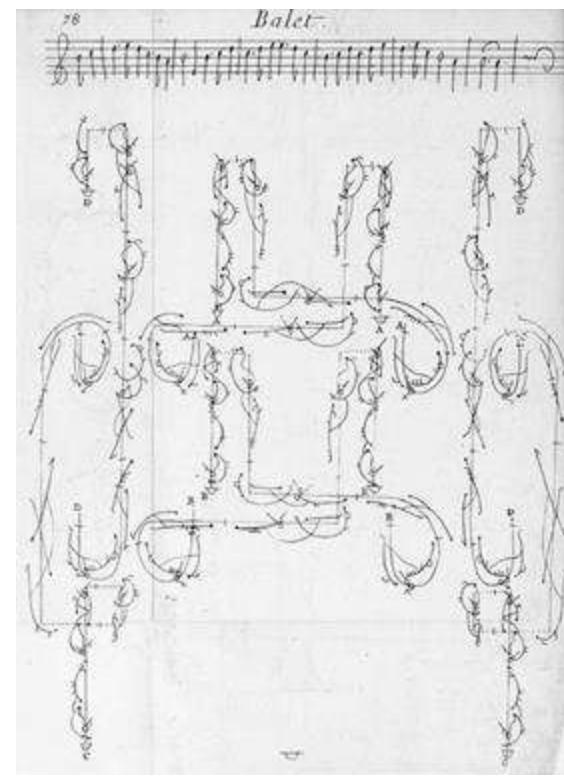
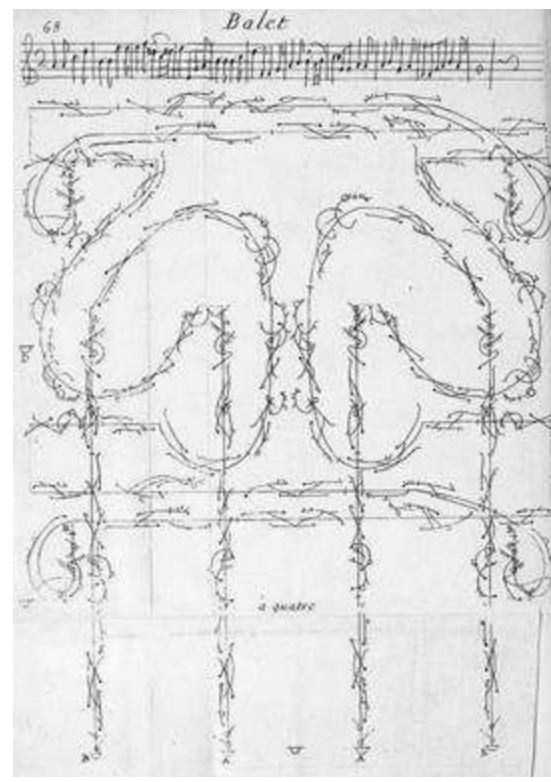
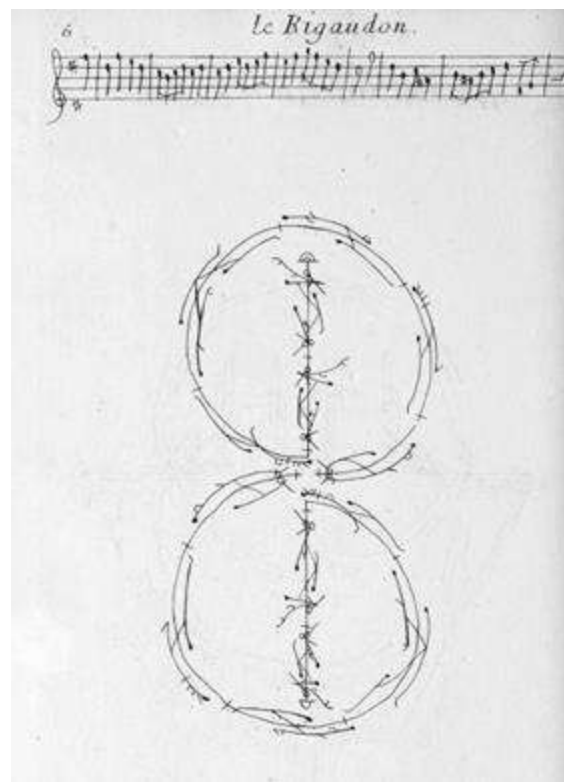
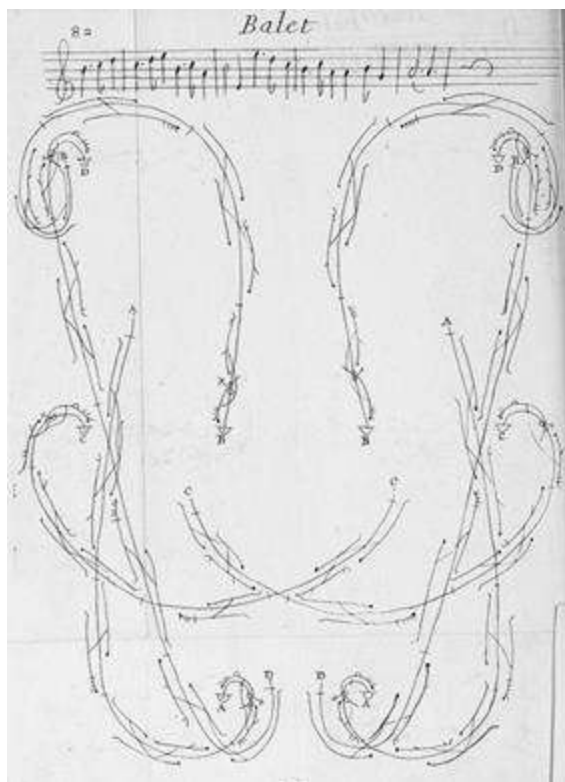
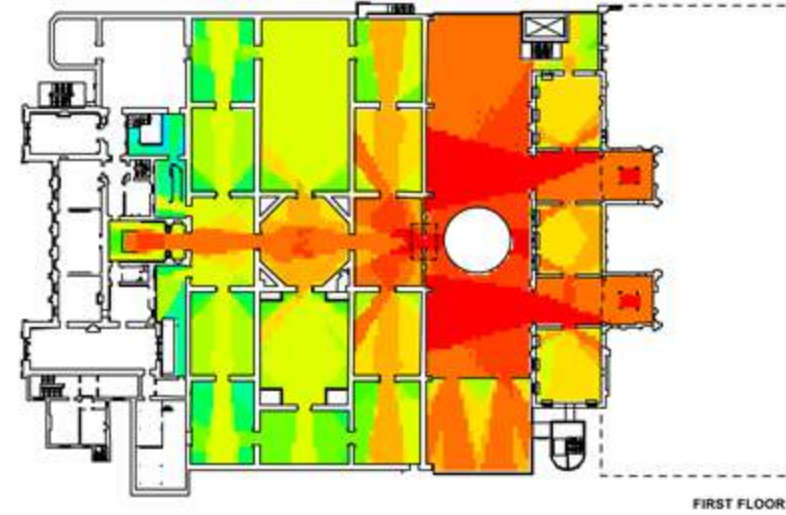
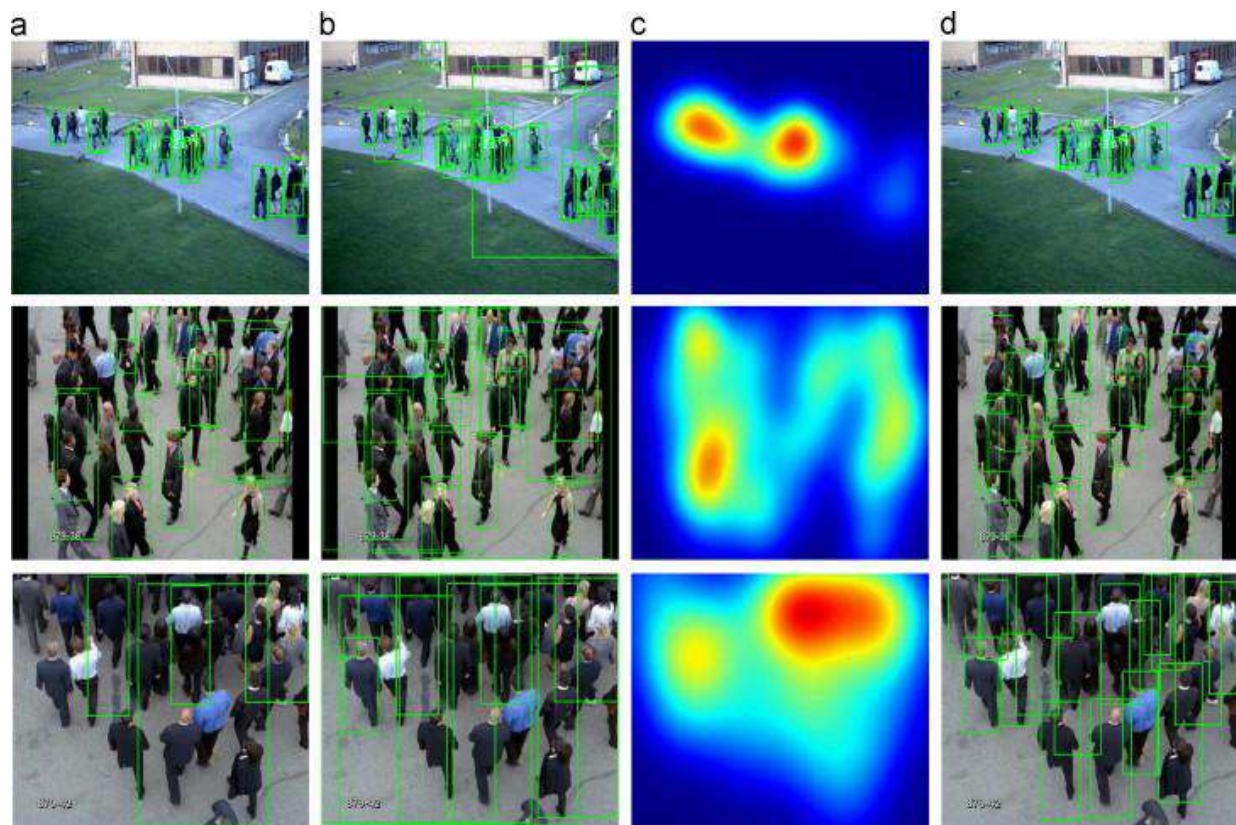
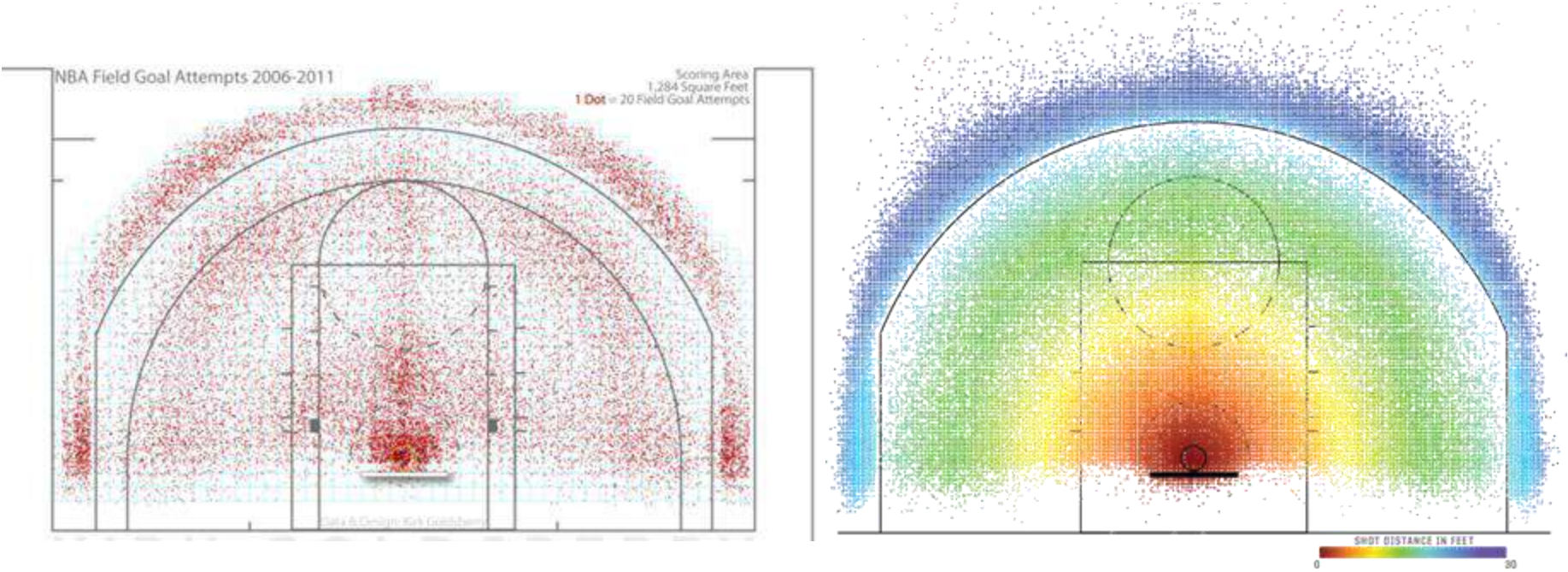


Image Credits: Raoul Auger Feuillet Chorégraphie, ou l'art de décrire la danse, 1700







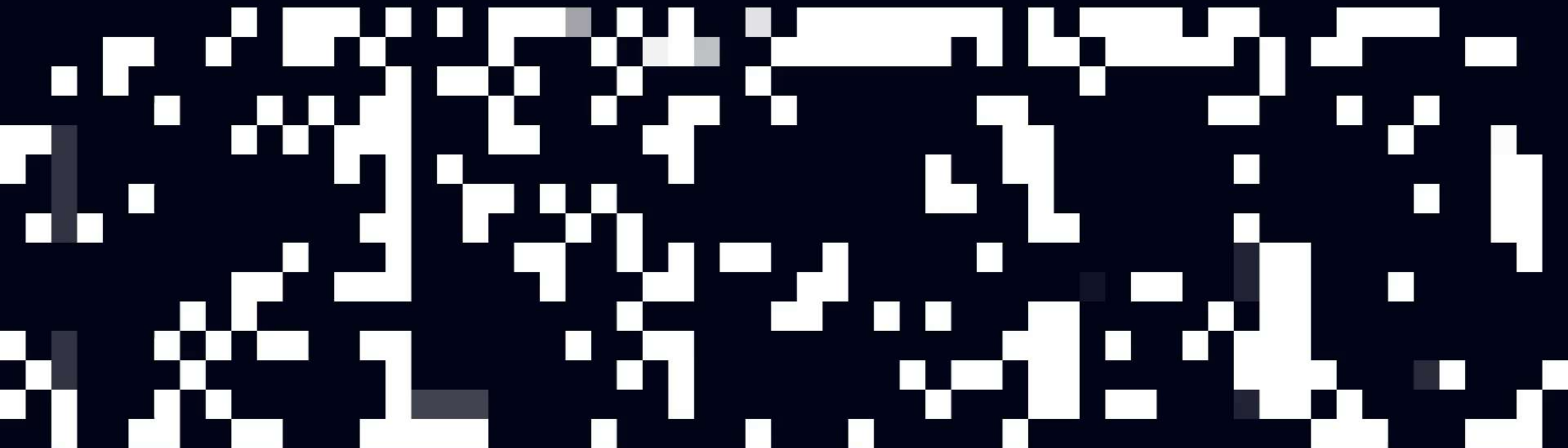


Shape Better Cities

95 &

Os ptOBdL pqirNlywik zhx figSSznNu

mgsfyd: ZdIKUR.SICeusr

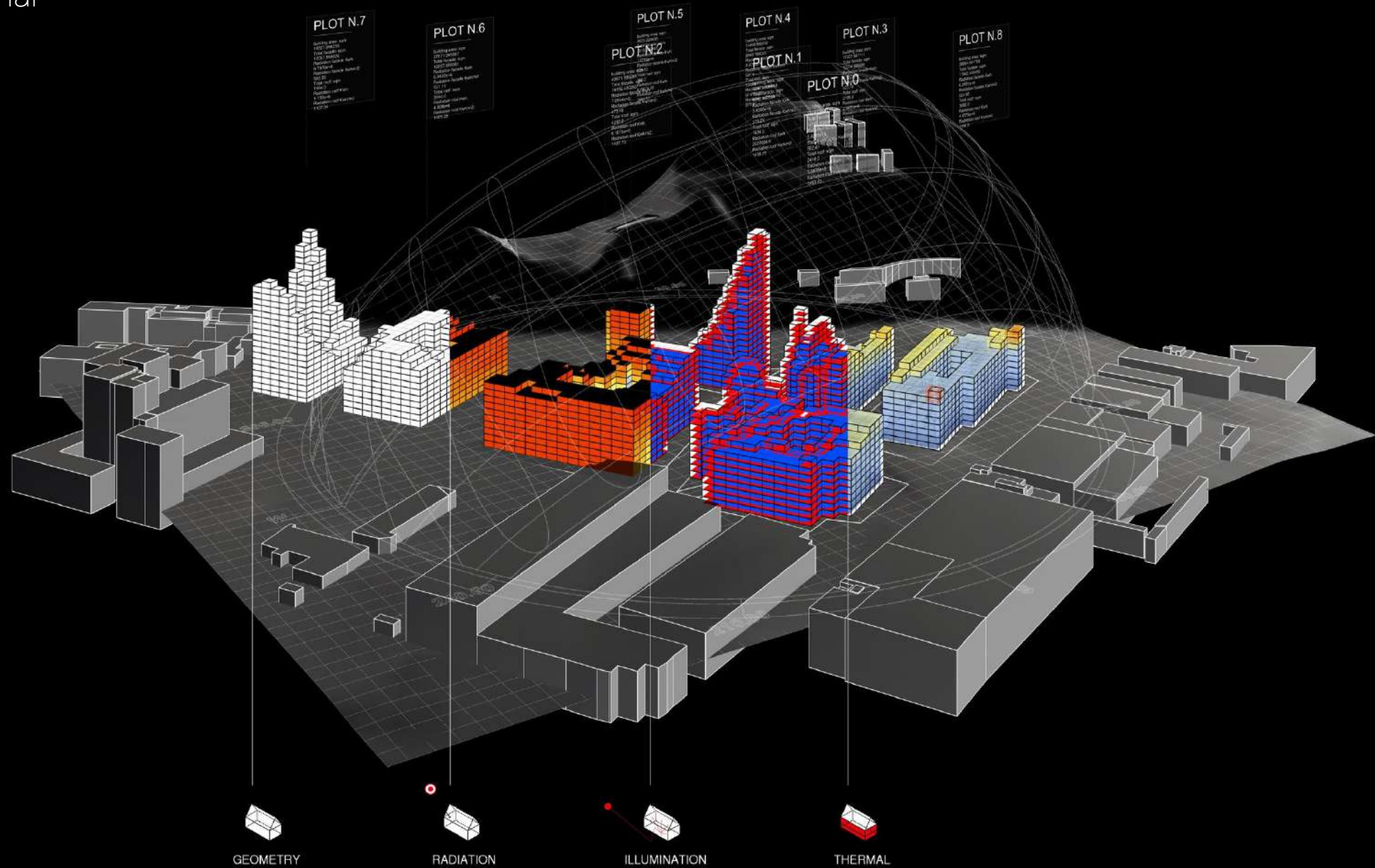




O.U.M.O.

Barcelona Regional

2014





OPTIMITACIÓ: CATÀLEG

[GENOMA]

TIPUS D'OPTIMITZACIÓ:

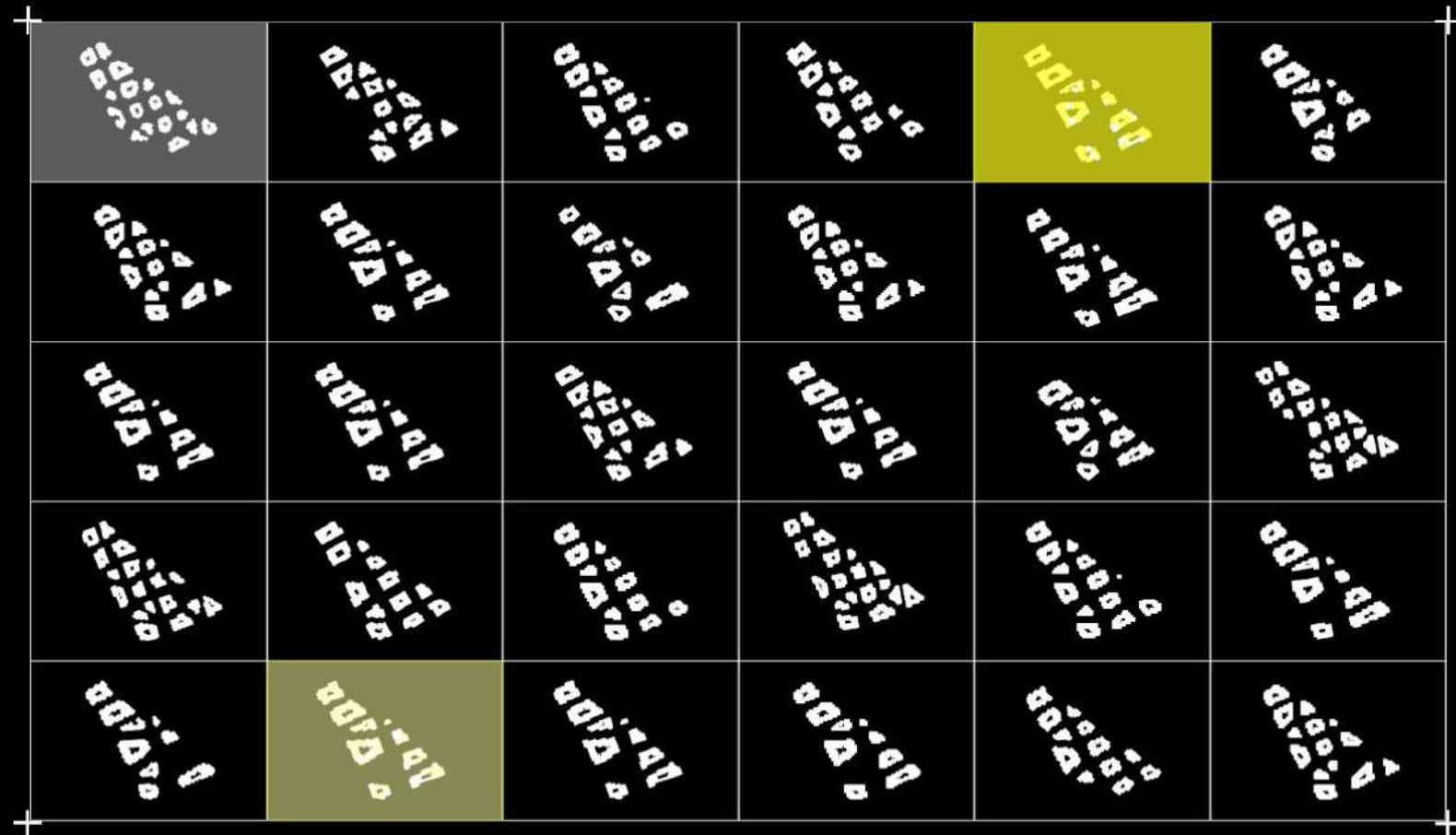
Mono-objectiu
Multi-objectiu

(POSSIBLES) CRITERIS D'OPTIMITZACIÓ

Radiació
Il·luminació
Demanda energètica
Compacitat
Edificabilitat
Alçada edificis
Trama urbana
Espai públic
Zones Verdes
Distribució d'usos
Etc.

Explicació

DUMO permet classificar i analitzar els barris des de diferents òptiques i paràmetres.



Energia



Índex Edificabilitat



Zones Verdes



Alçada Màxima



Trama Urbana



+

ENERGIA: MODELS D'ANÀLISIS

[MODEL A]

ÀREA DE PLANS:
183915 m²

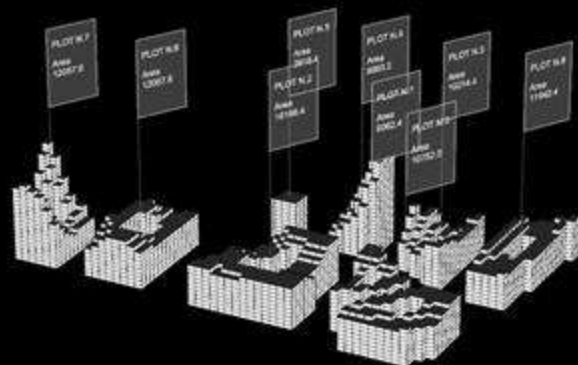
ÍNDEX EDIFICABILITAT:
3.87

ESPAI PÚBLIC ZONA:
32250 m²

NOMBRE DE PARCEL·LES:
10

NOMBRE D'EDIFICIS:
9

ALTURA MÀXIMA:
60 m



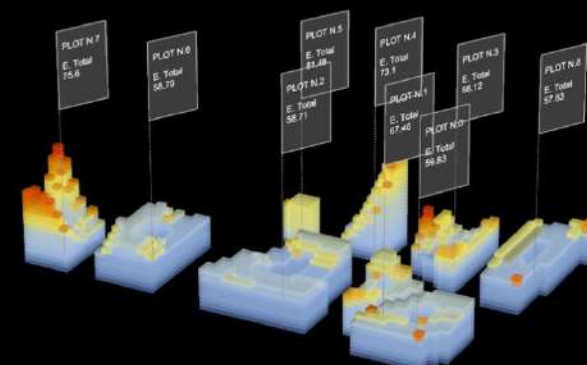
+

ENERGIA: TOTAL

[MODEL A]

26%

de millora respecte barri de referència



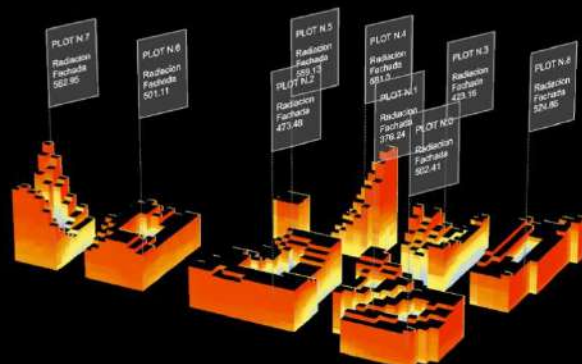
+

RADIACIÓ: FAÇANA

[MODEL A]

12%

de millora respecte barri de referència



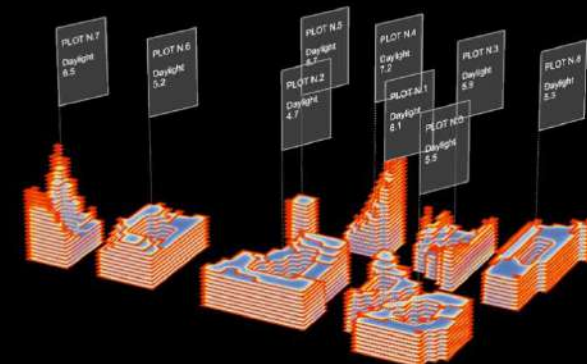
+

IL·LUMINACIÓ: DAYLIGHT FACTOR

[MODEL A]

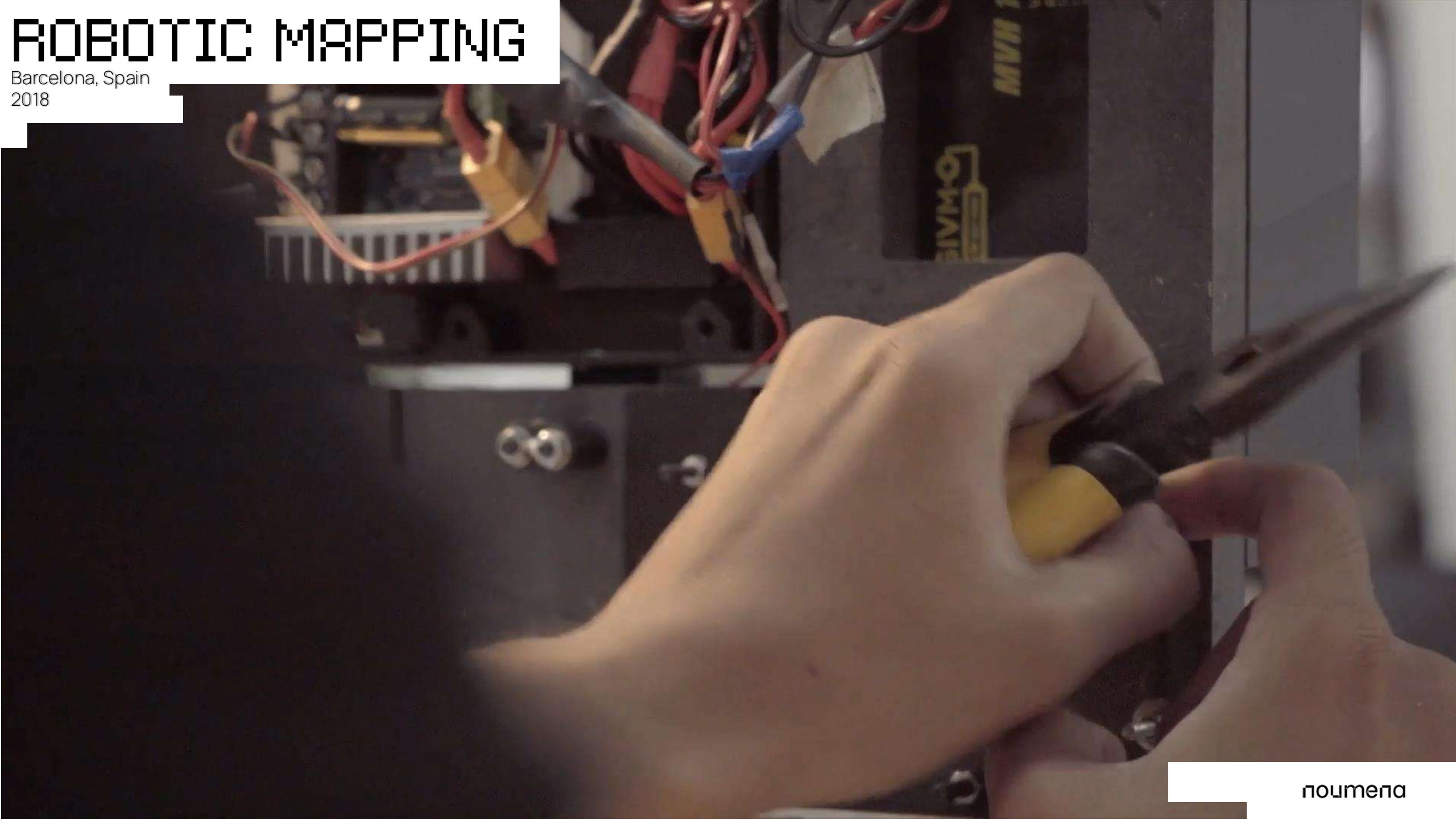
9%

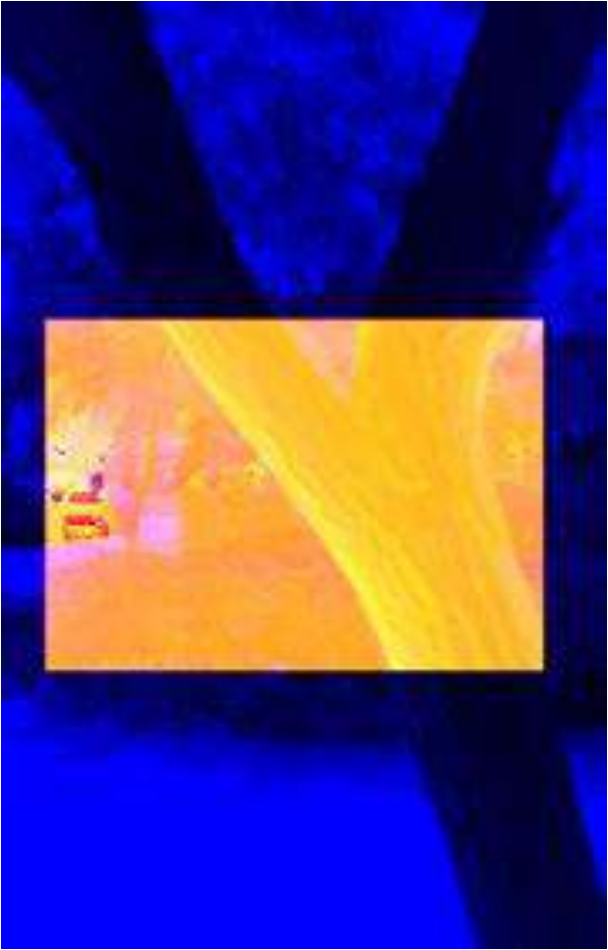
de millora respecte barri de referència

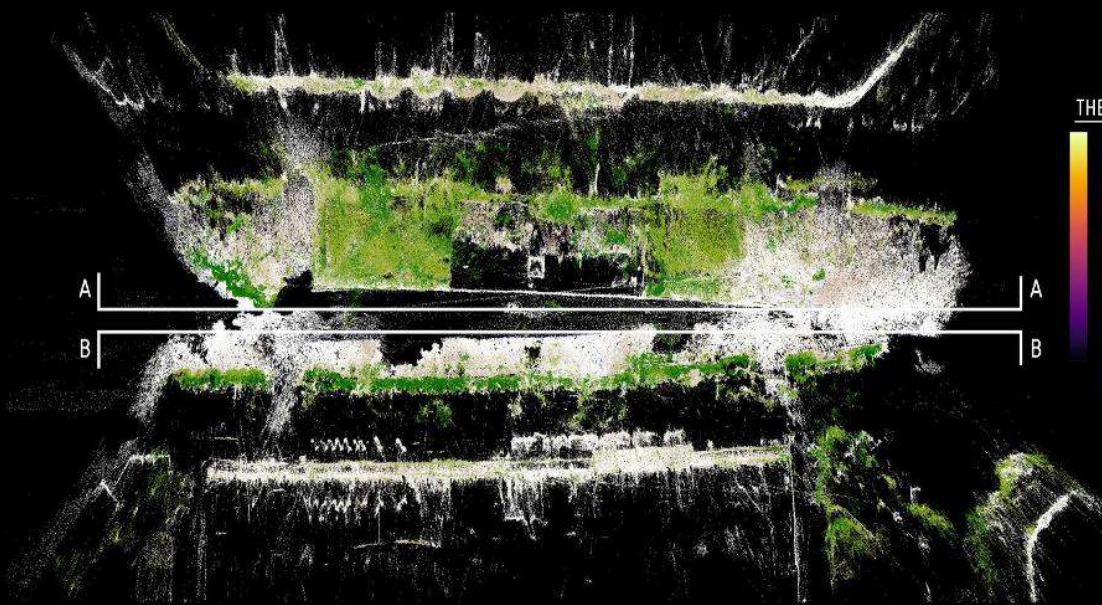


ROBOTIC MAPPING

Barcelona, Spain
2018







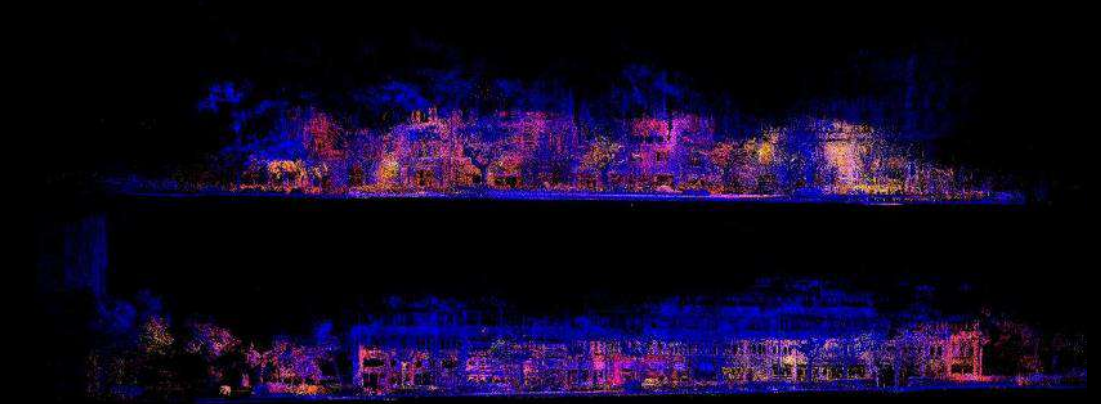
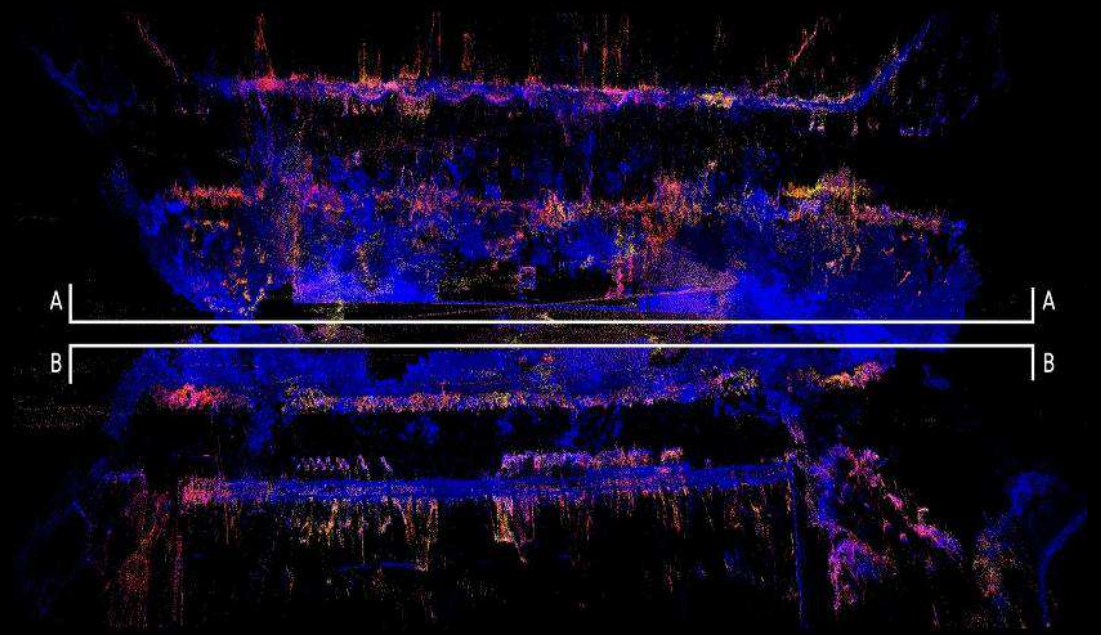
PLAN VIEW

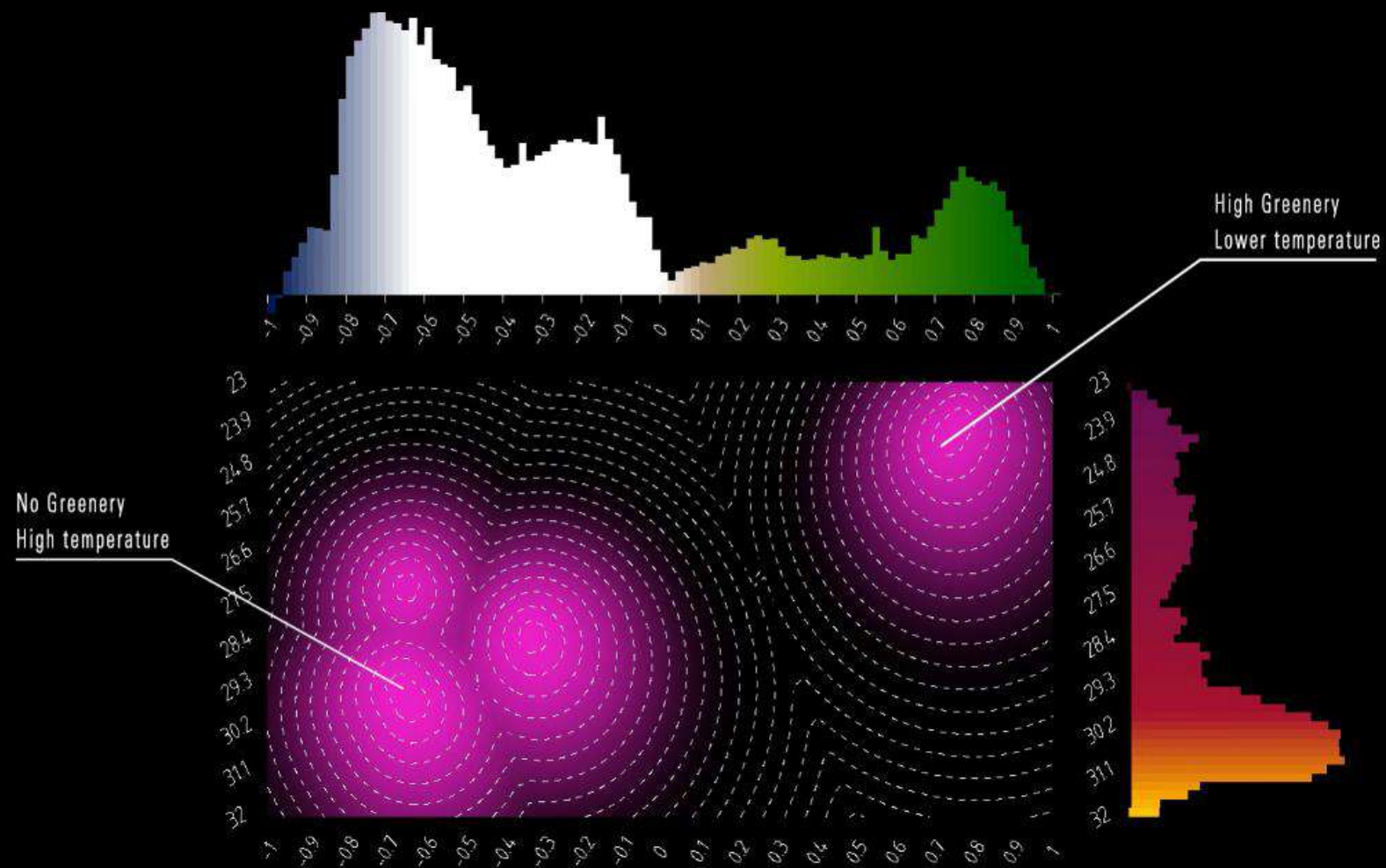


SIDE A



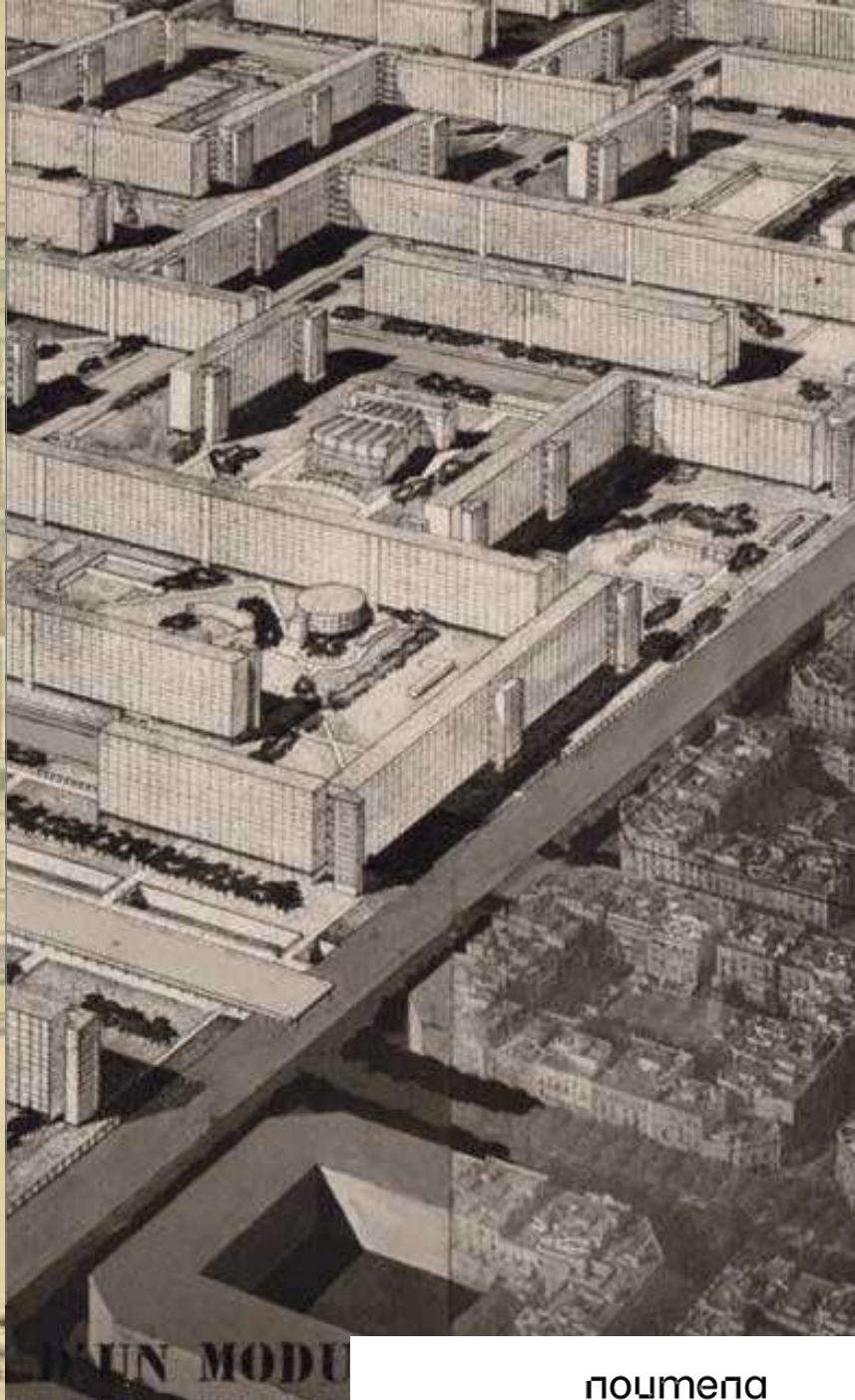
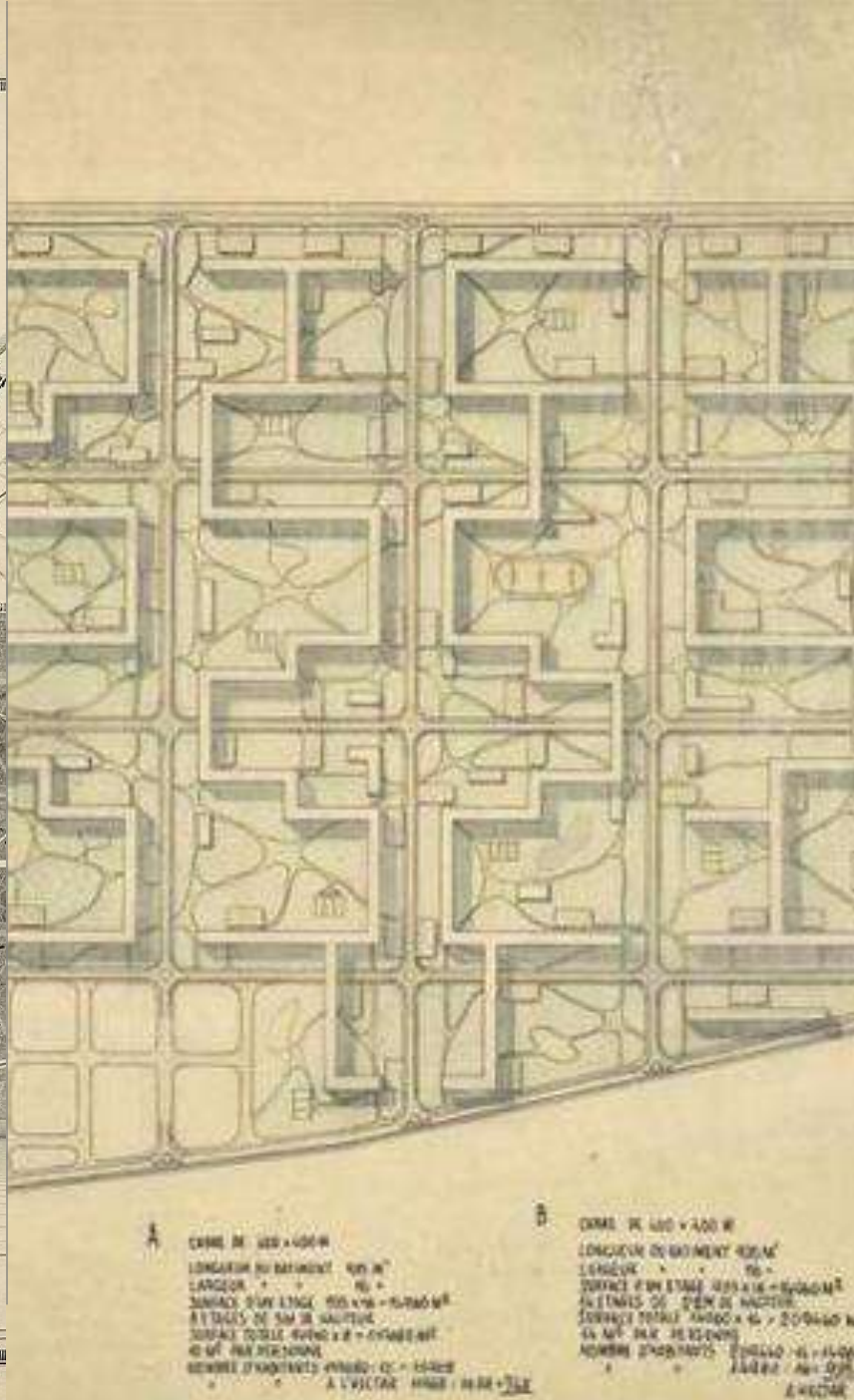
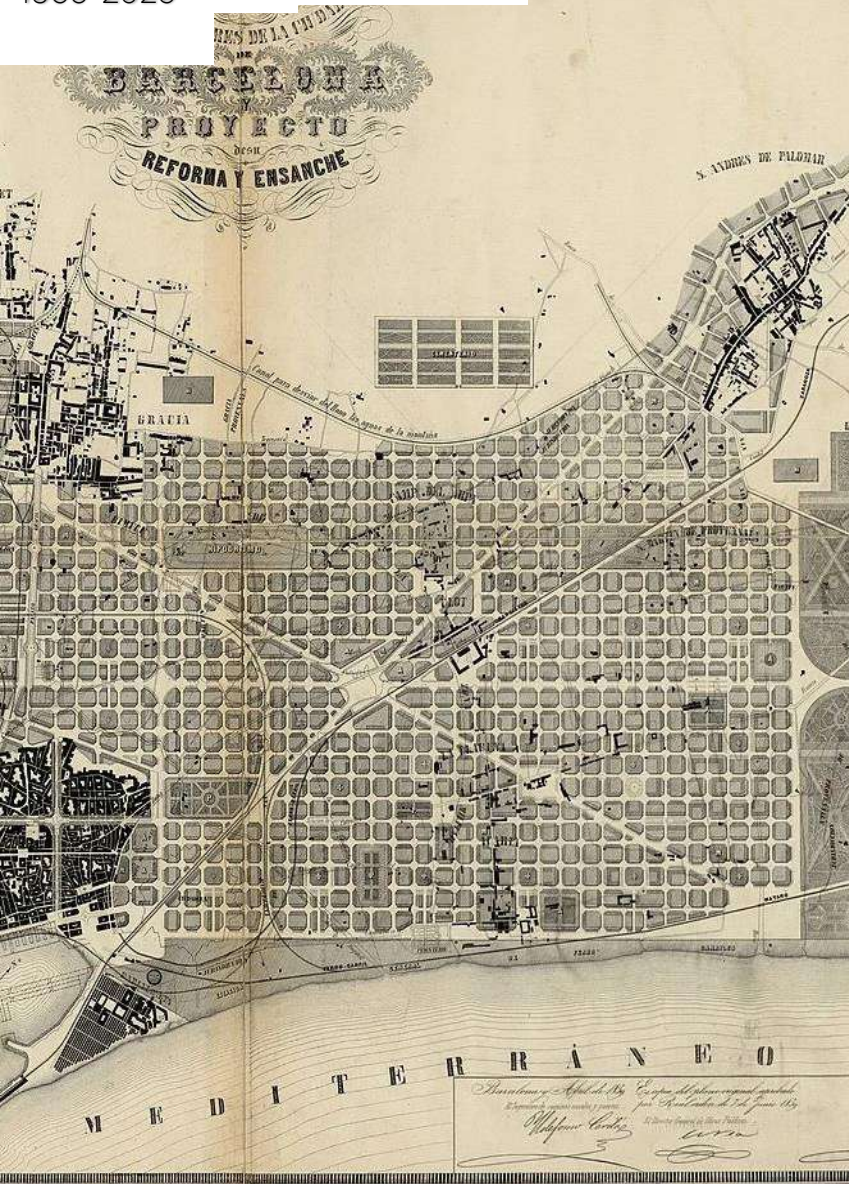
SIDE B





PLANNING

Programmable Urban Landscapes
1859-2025



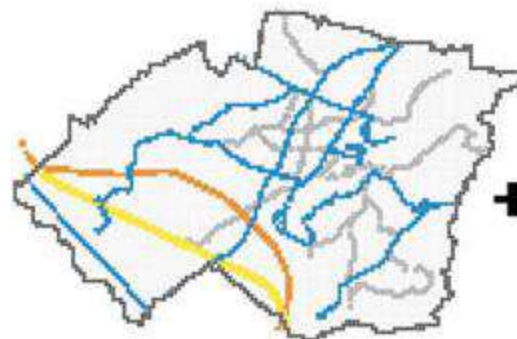
NED

talks

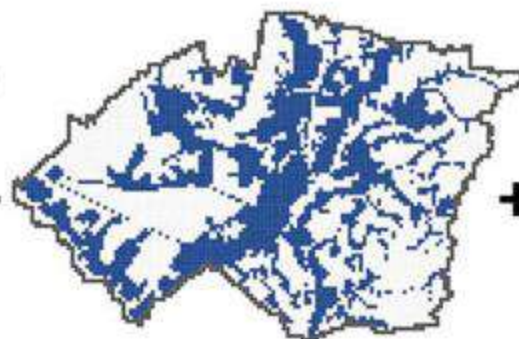
Hi everybody! I'm Ned.
I am here to present a study on
the issues of urban planning and
the potential of new parametric
tools in generating innovative ur-
ban strategies. As you know cit-
ies are data containers con-
stantly changing. How to interpret
them? Which one to choose? Our
case study is a small Italian city,
Frosinone.



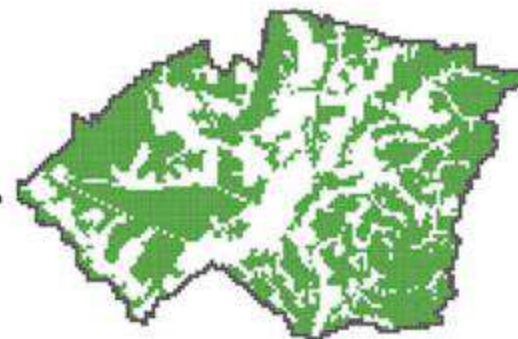
FASE 1\GENERAZIONE ZONING (GZ)



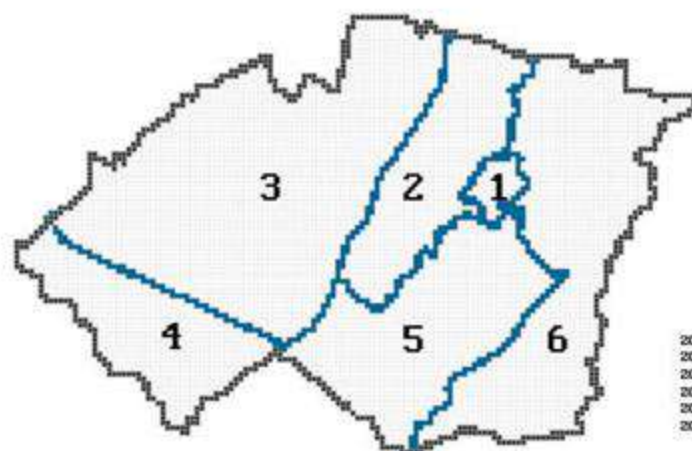
GZ\SISTEMA INFRASTRUTTURALE\ANALISI



GZ\SISTEMA INSEDIATIVO\ANALISI



GZ\ECOSISTEMA URBANO\ANALISI



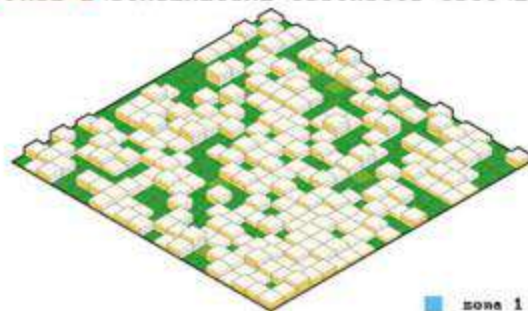
- ZONA 1\ CENTRO STORICO
- ZONA 2\ AREA COMMERCIALE
- ZONA 3\ AREA SERVIZI
- ZONA 4\ AREA INDUSTRIALE
- ZONA 5\ AREA RESIDENZIALE
- ZONA 6\ AREA D' ESPANSIONE

To obtain a rational zoning of the city we overlapped the building fabric and the urban green infrastructure system. The result is a zoning divided into six areas.

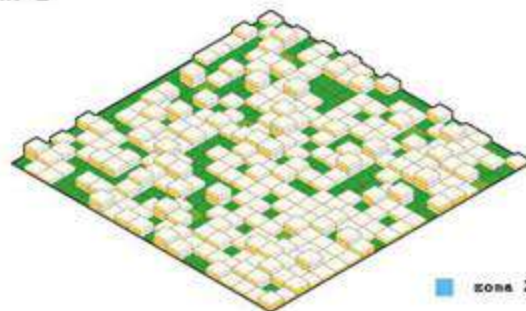




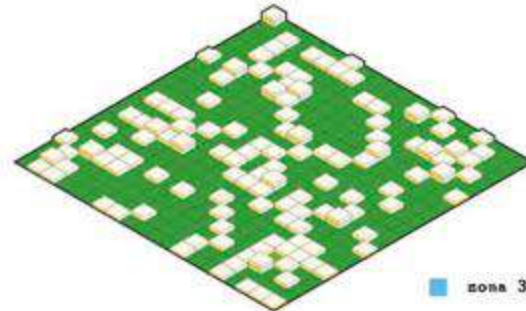
SIMULAZIONE COSTRUITO [SC]\ZONA 2



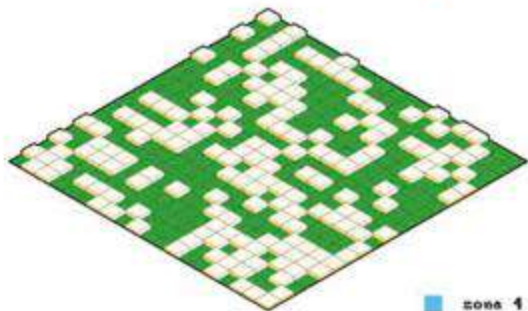
zona 1



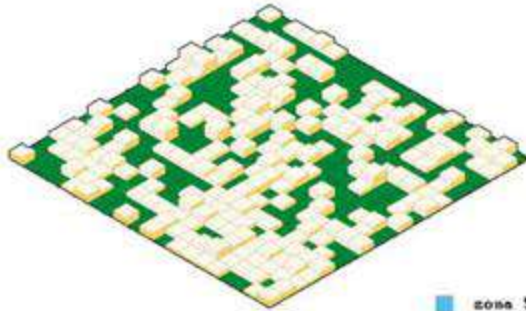
zona 2



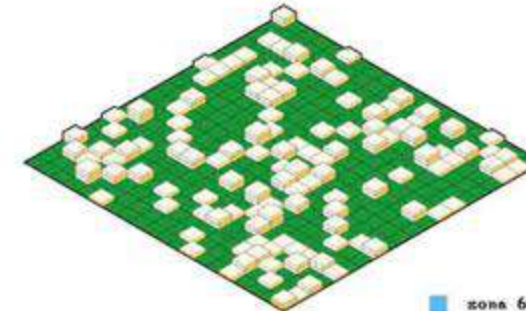
zona 3



zona 4



zona 5



zona 6



ZONA 1
[SC]\C.....56%
[SC]\V.....14%
[SC]\V\URT...4%



ZONA 2
[SC]\C.....39%
[SC]\V.....61%
[SC]\V\URT...5%



ZONA 3
[SC]\C.....25%
[SC]\V.....75%
[SC]\V\URT...1%



ZONA 4
[SC]\C.....37%
[SC]\V.....63%
[SC]\V\URT...0%



ZONA 5
[SC]\C.....52%
[SC]\V.....40%
[SC]\V\URT...1%



ZONA 6
[SC]\C.....25%
[SC]\V.....75%
[SC]\V\URT...0%

LEGENDA

[SC]\COSTRUITO

[SC]\VERDE

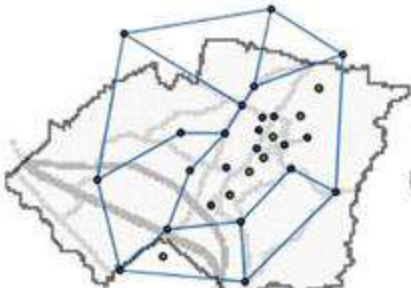
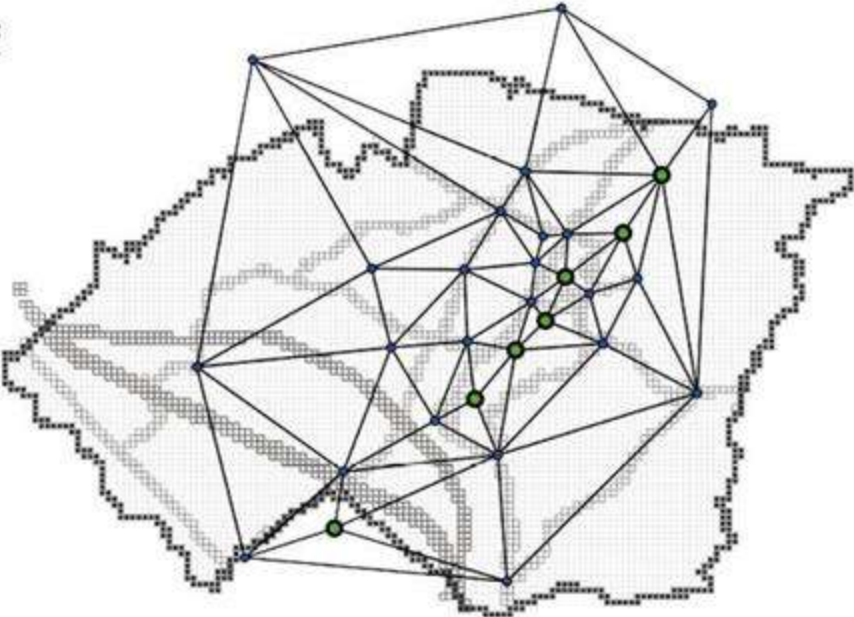
[SC]\VERDE\VERDE ATTREZZATO

Land use is a key issue. In these schemes we show the proportions between the buildings and the green zones. Each area has different typologies and densities characteristics. The green services are generally poor. The low density of the out-lain areas is rather high in the main areas, where, however, buildings aren't inexplicably developed in height.



FASE 6\GENERAZIONE NETWORK [GN]

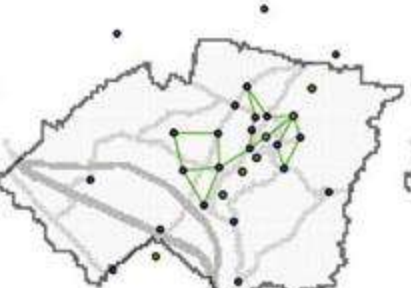
[GN]\
LA CONNESSIONE DEI POLI CREA UNA RETE
CHE DIVIENE UN NUOVO STRUMENTO DEL S18-
TEMA INFRASTRUTTURE.



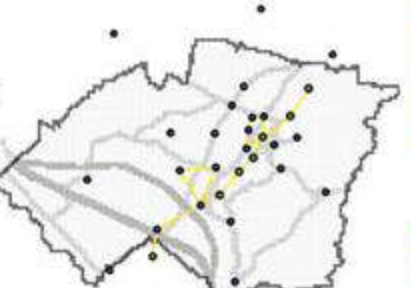
[GN]\STRADE A SCORRIMENTO VELOCE



[GN]\TRACCIATO DEI MEZZI PUBBLICI



[GN]\PERCORSI PEDONALI



[GN]\PERCORSI CICLABILI

So here it is our mesh. The intention is to establish road layouts which have the potential, depending on the program that the city decides to adopt, to be plotted in highways, lanes for public transport, pedestrian or cycle paths.



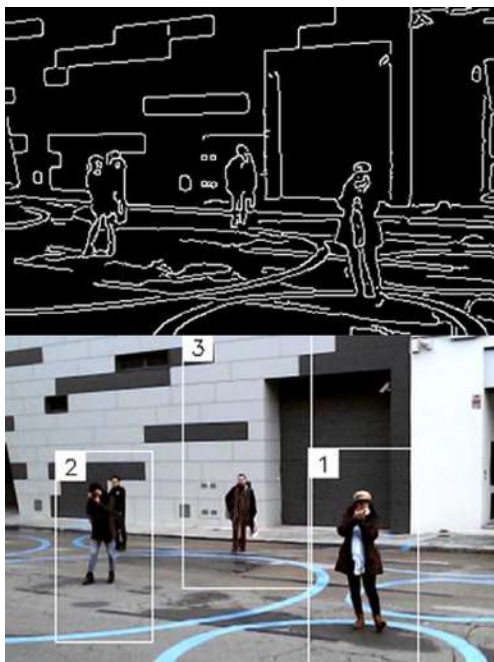
SUPERILLA

Barcelona, Spain
2016











BREATHING CITY

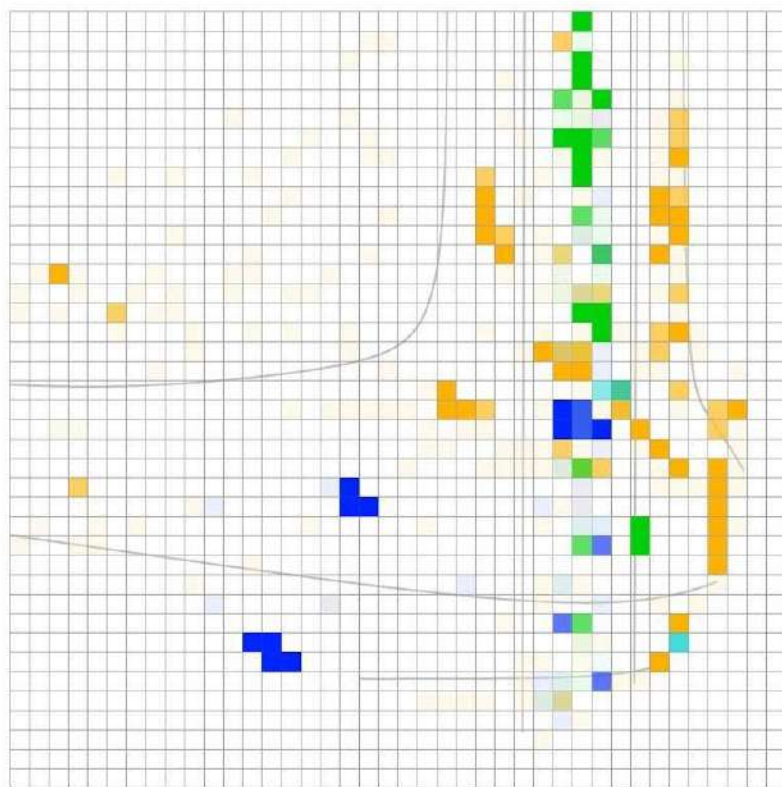
Venice Biennale
2021

2020-10-11 15:00:07

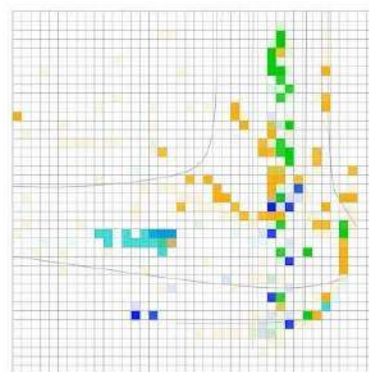


IPC

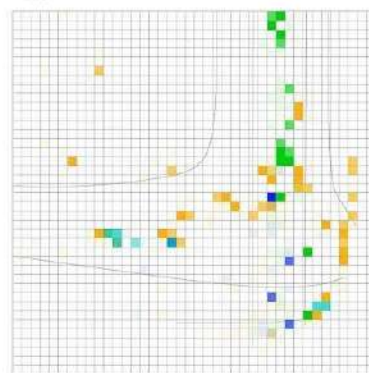
полтепа



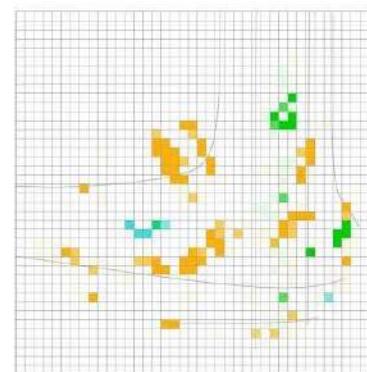
(a)



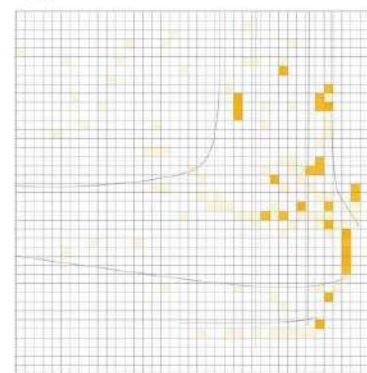
(b)



(c)

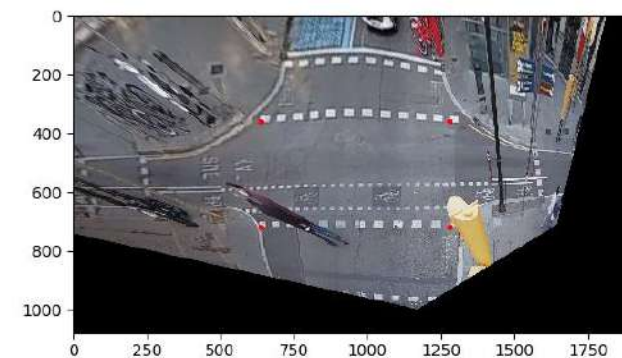
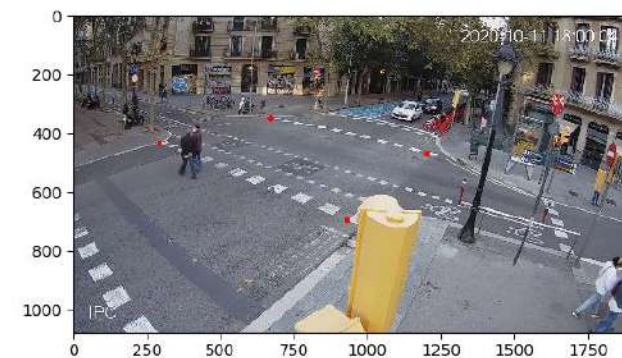


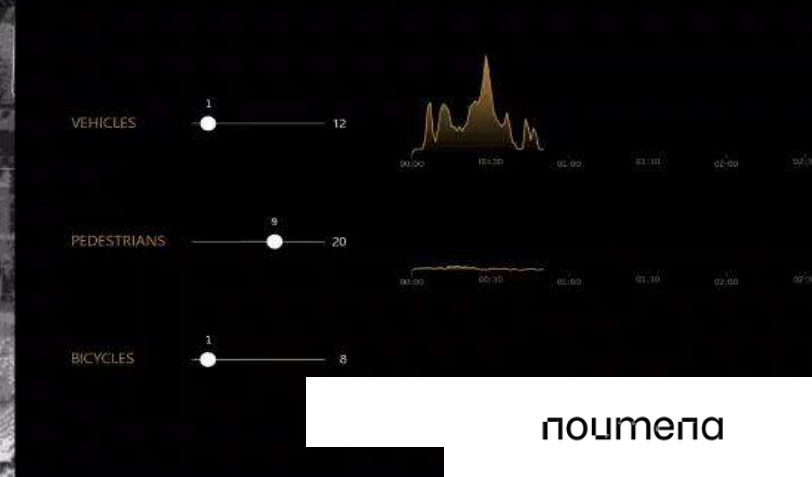
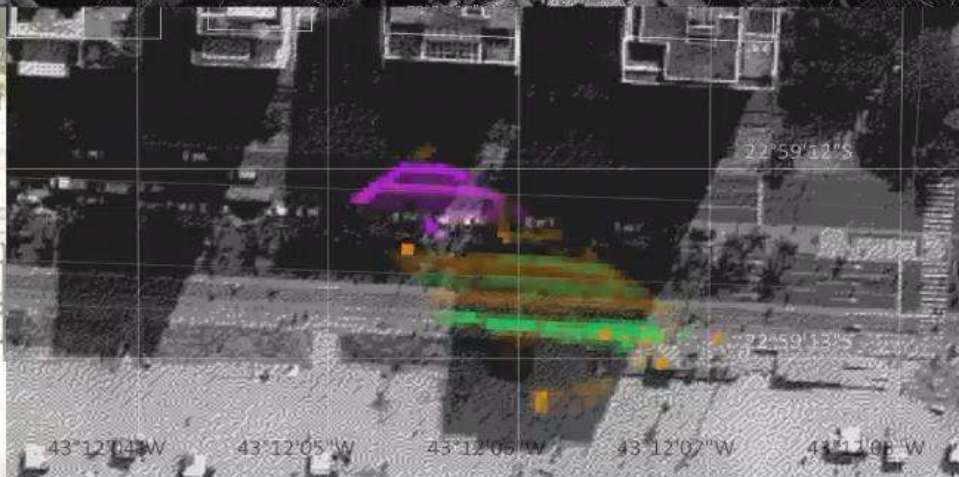
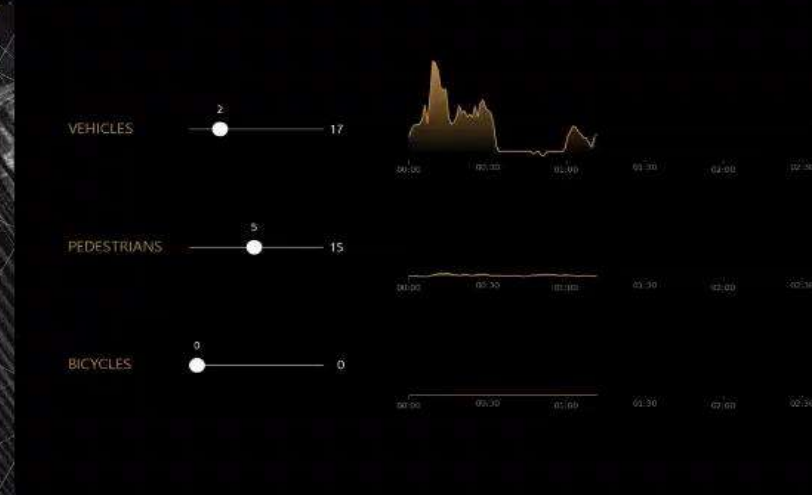
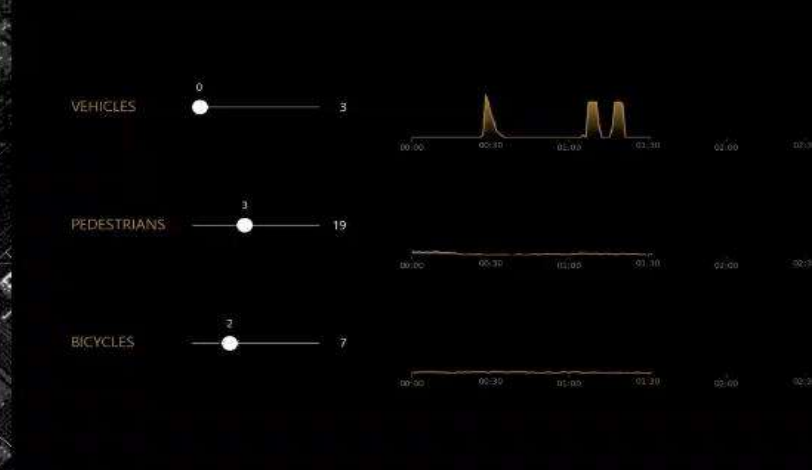
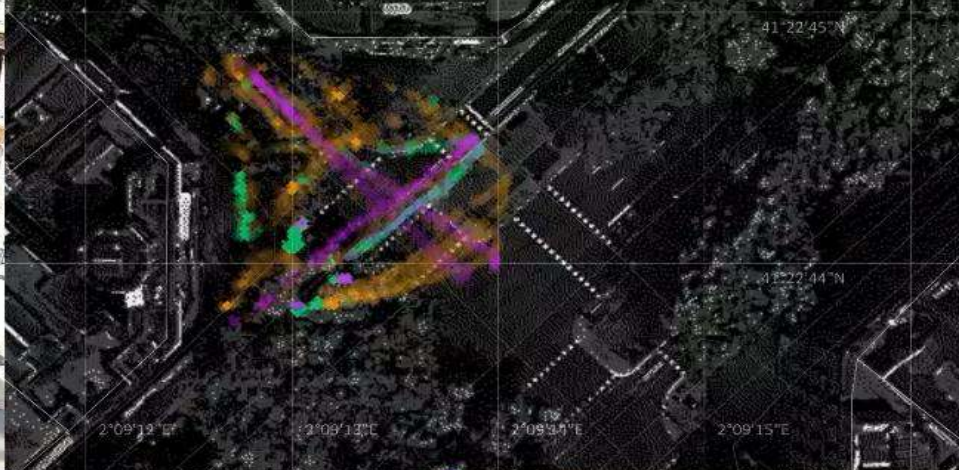
(d)



(e)

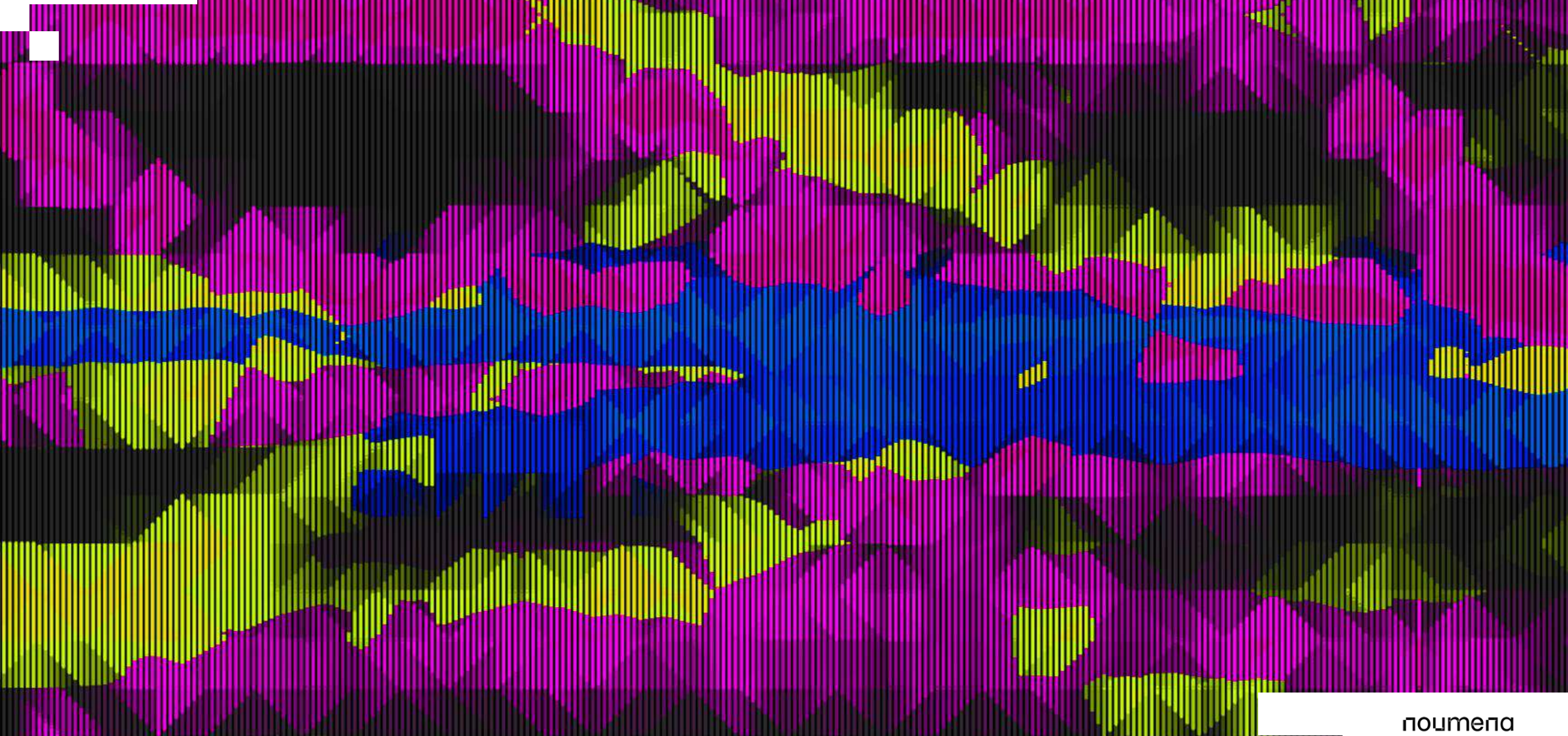
■ Cars
 ■ Pedestrians
 ■ Motor Bikes
 ■ Bicycles





GREEN AXES

Barcelona
2022-2024



полтора

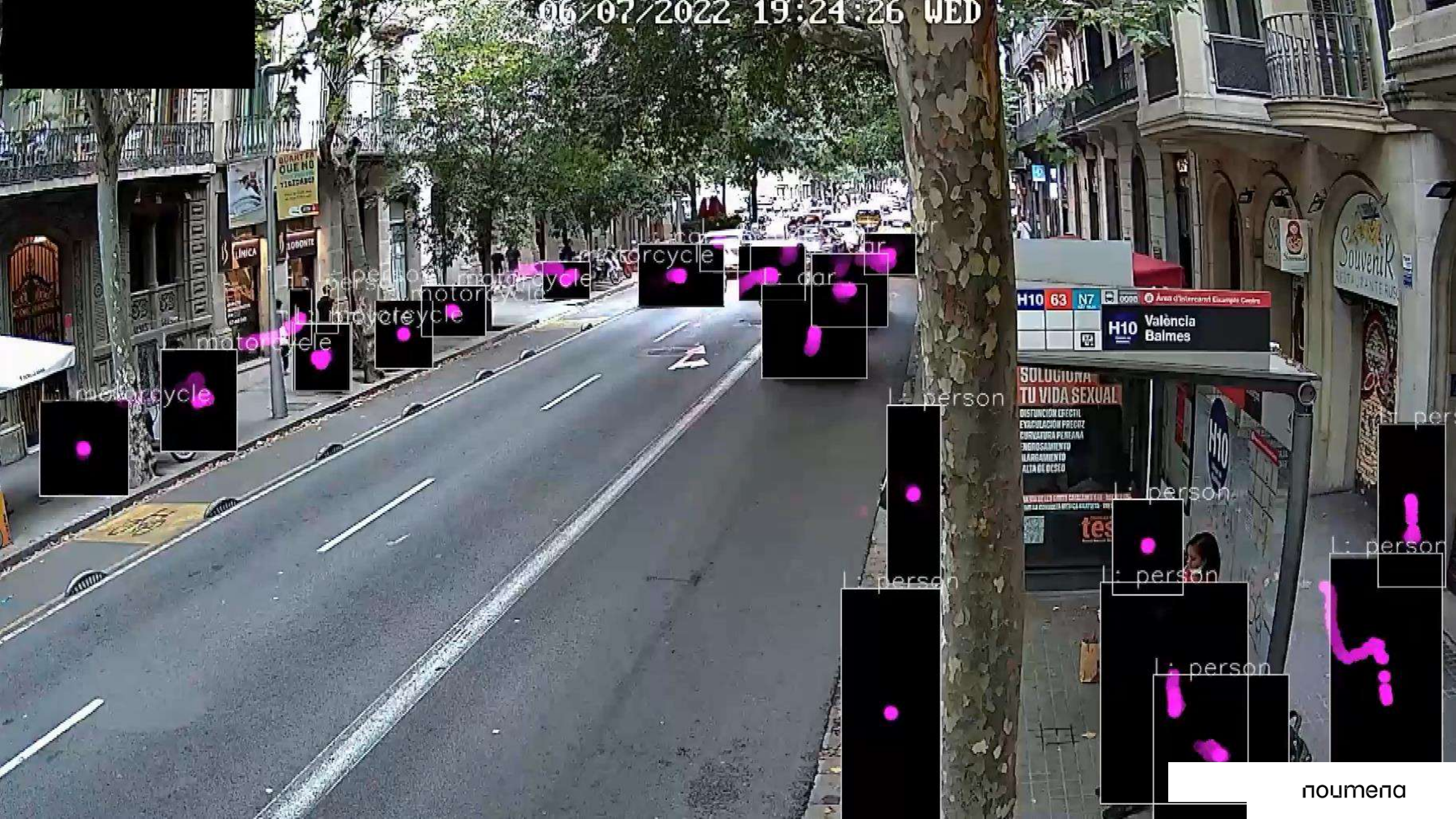


● Camera_Position_2022

● Camera_Position_2023

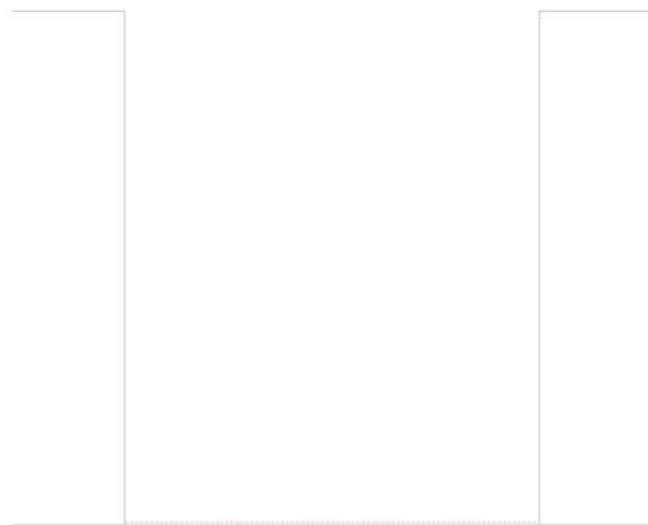
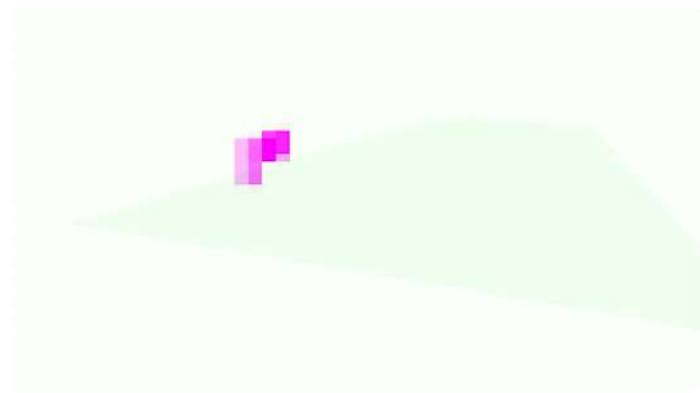
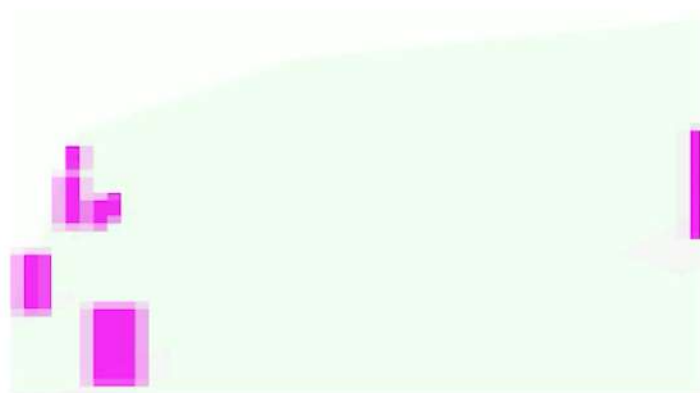




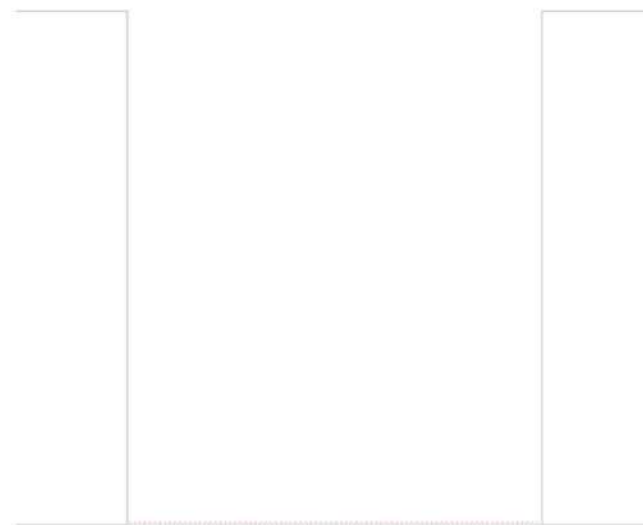


24/11/2023 09:00:50 FRI





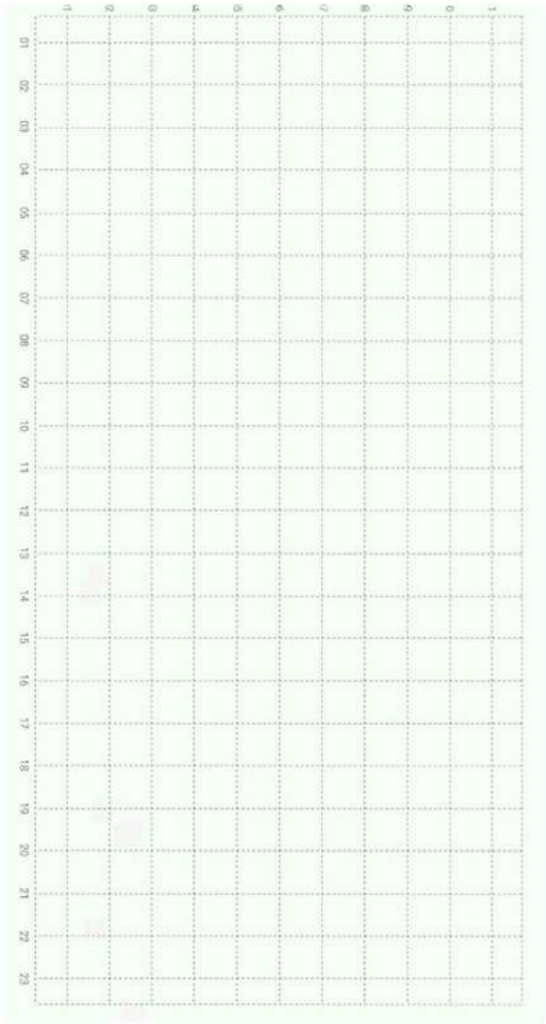
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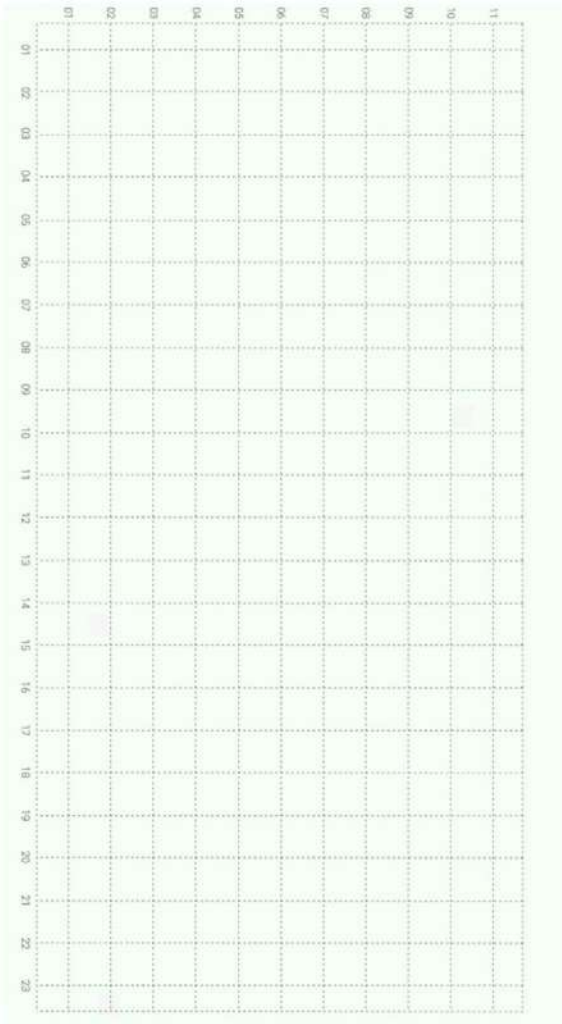
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Consell de Cent - Girona 09:00am

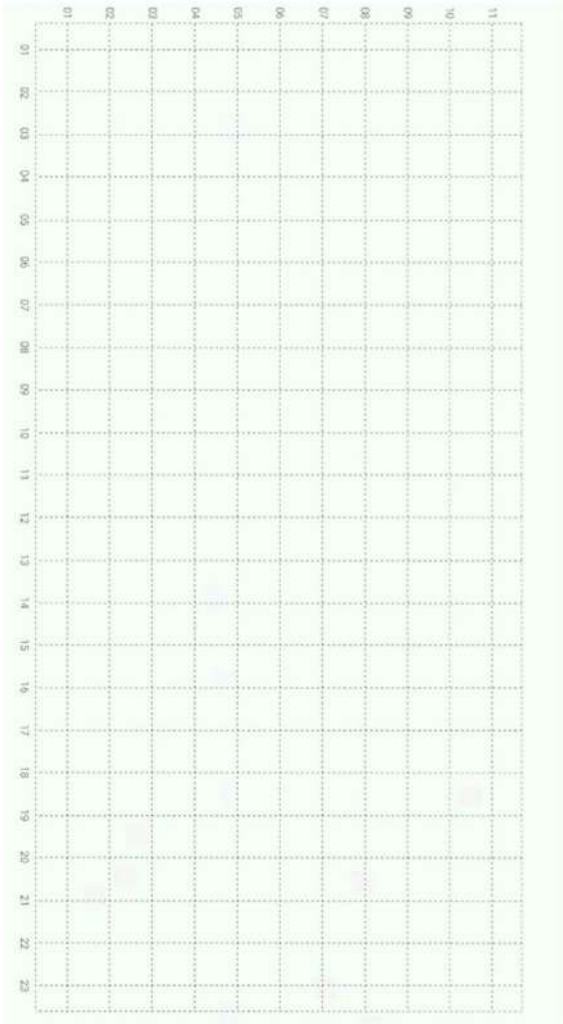
политика



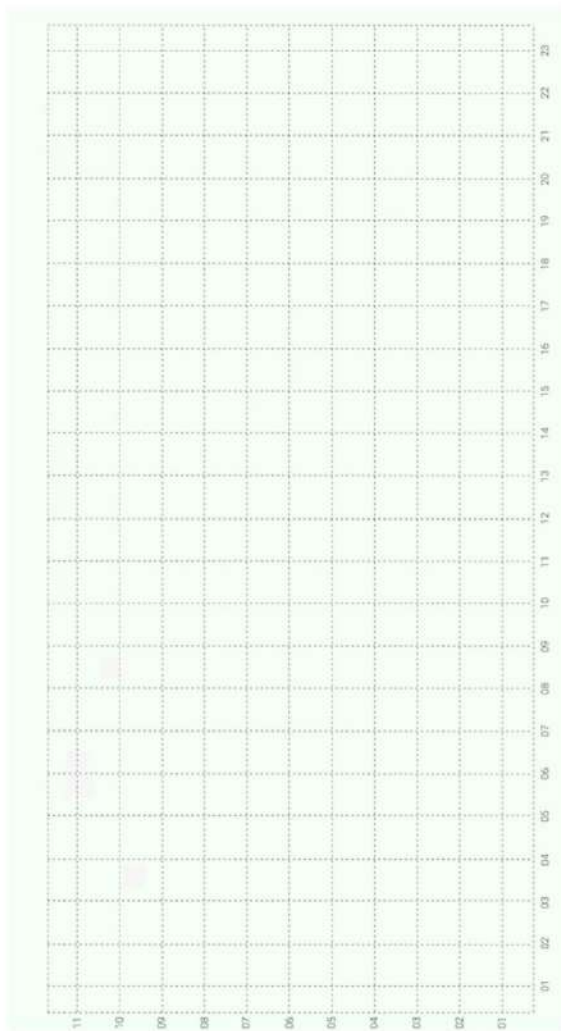
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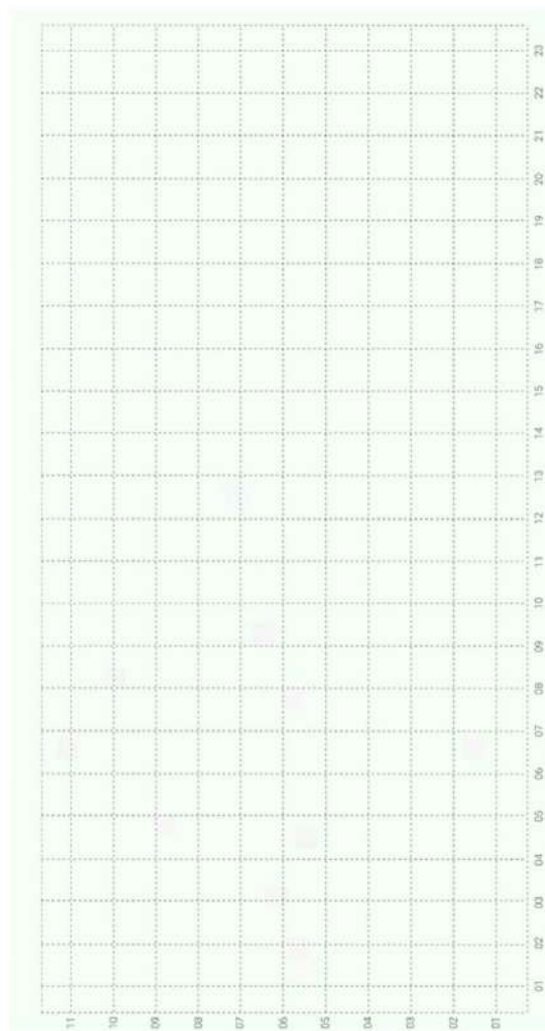
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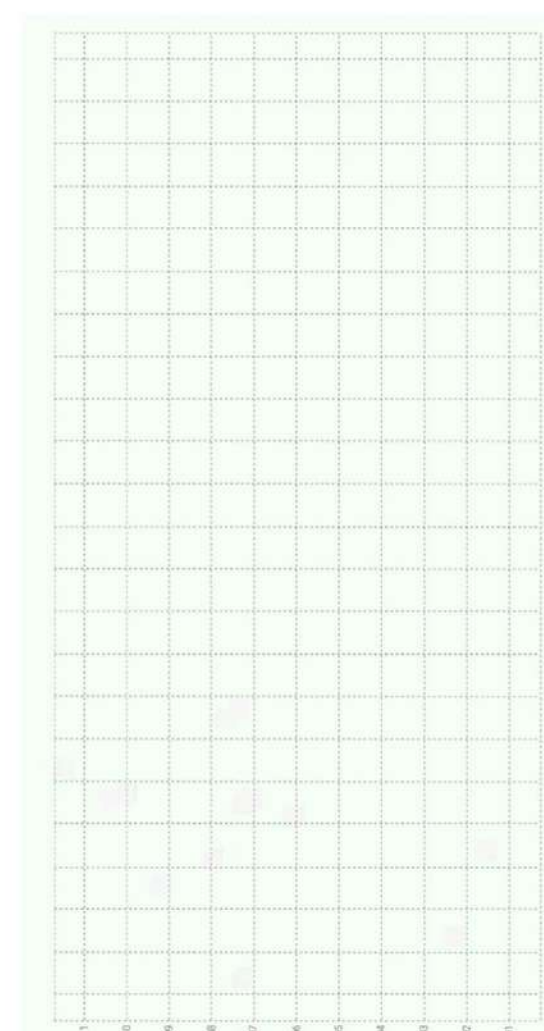
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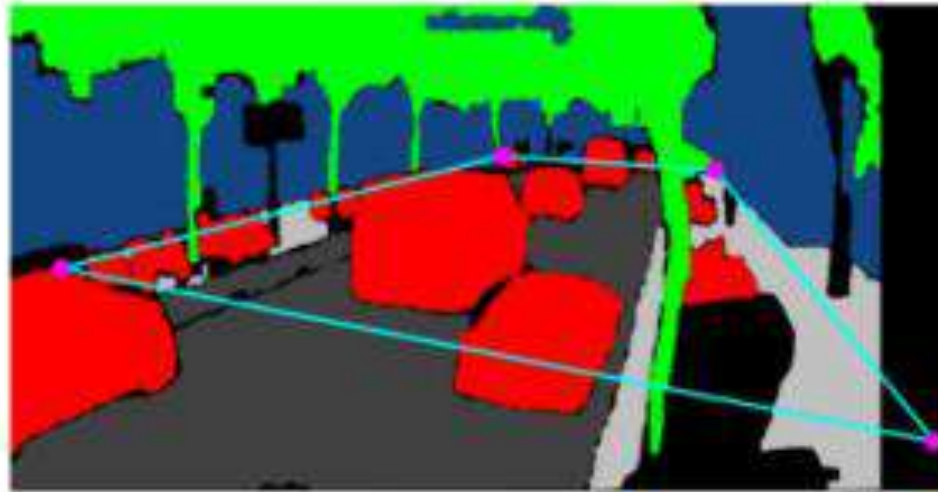
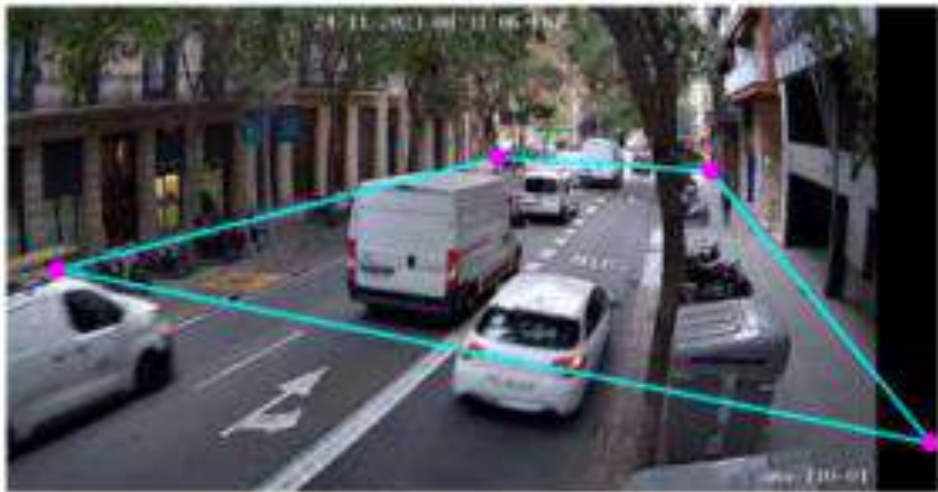
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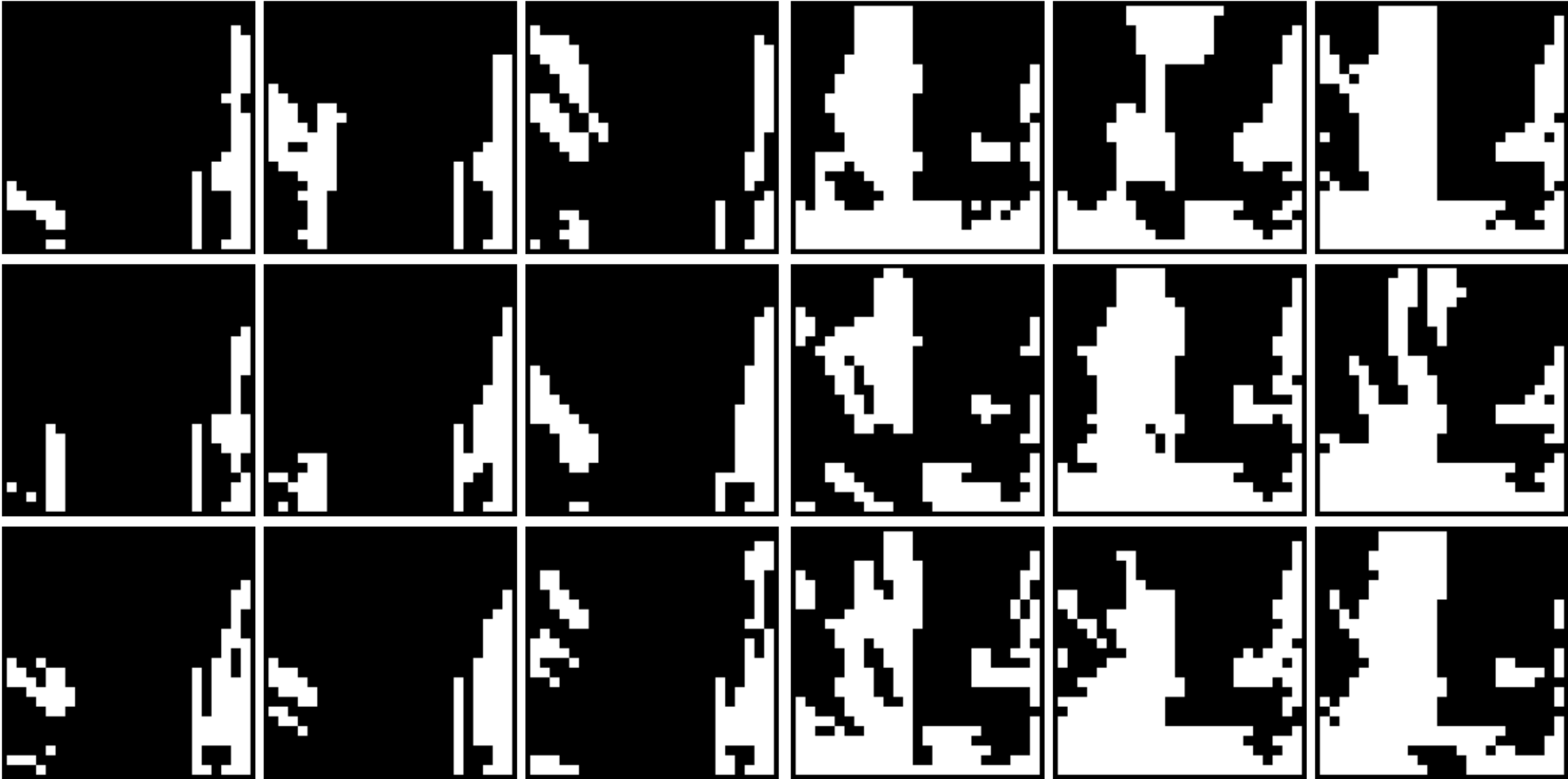


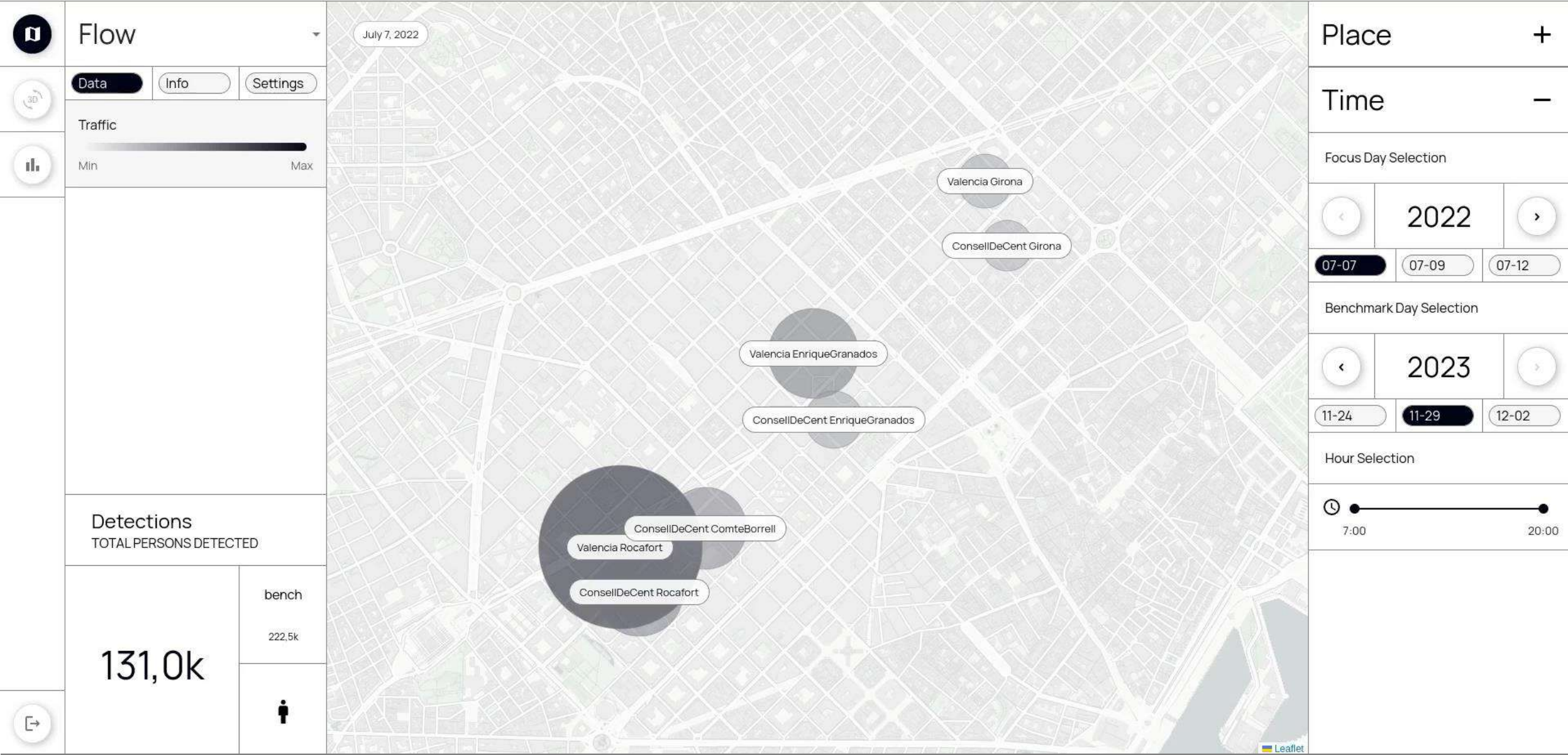
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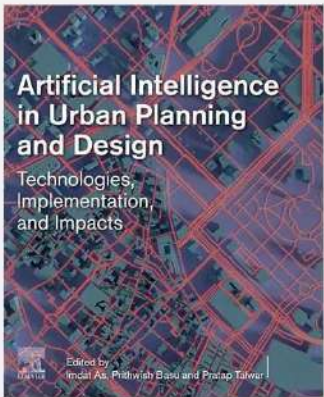






Leaflet

Artificial Intelligence in Urban Planning and Design
(Elsevier, 2022)



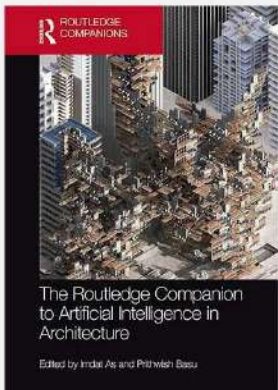
Biennale di Venezia, Comunità resilienti.
(D Editore, 2021)



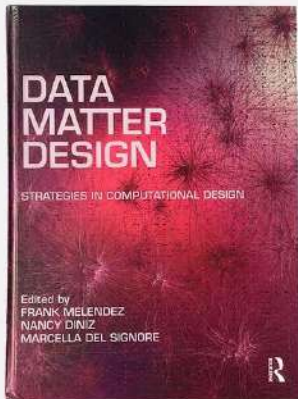
IAAC BITS, Learning Cities
(ACTAR, 2022)



Routledge Companion to
Artificial Intelligence in Architecture (2021)



Data, Matter, Design: Strategies in Computational Design
(Routledge, 2021)



Responsive Cities Symposium
(2023)



