VLST
Lecture Series
2014-2015
www.arthistory.upenn.edu/vlst/

HUGO SPIERS UNIVERSITY COLLEGE LONDON

BRAINS ON SHOW

NEUROSCIENCE IN THE VISUAL ARTS

4:30 PM THURSDAY NOVEMBER 13, 2014

UNIVERSITY OF PENNSYLVANIA | LAW SCHOOL | SILVERMAN HALL 240A
(enter from 34th street)

No realm of life is left unexplored by artists. A myriad of forms and objects are explored, but one object is different. Unlike all other objects depicted, the artist's brain is the very object considering itself. The explosion of neuroscience research in the last decades has been accompanied by a similar flourishing interest in exploring the brain in the visual arts. This lecture will examine the different ways in which artists have considered the brain. It will also discuss the challenges and progress that can be made via collaborations between artists and neuroscientists.

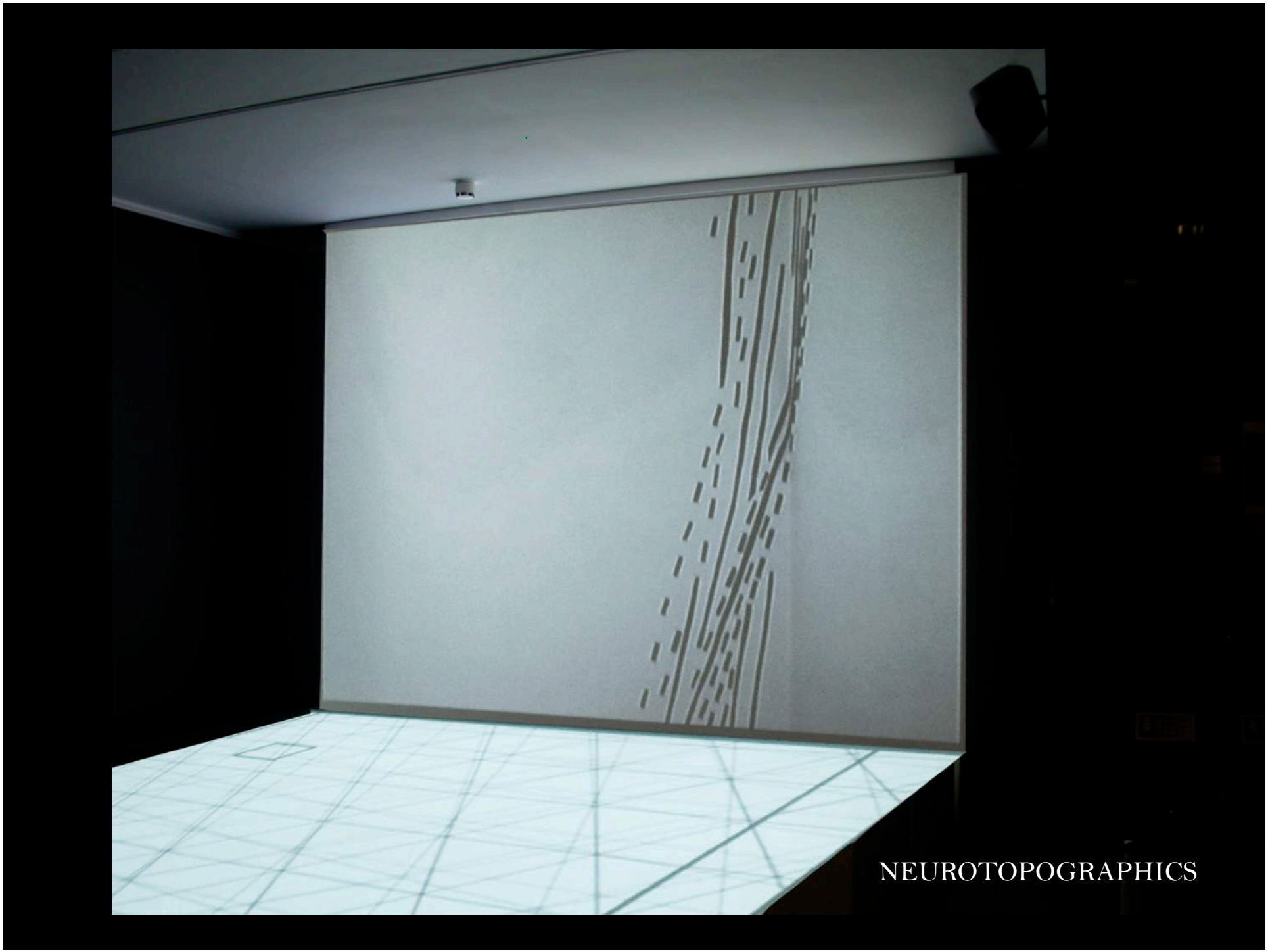
Overview

- Introduce two installations
- Discuss the creative process that led to these installations
- How does this work relate to other visual art works exploring neuroscience topics
- Do painters, sculptors and architects think differently about space?

Gimpel Fils Gallery

Wellcome Trust Charity

NEUROTOPOGRAPHICS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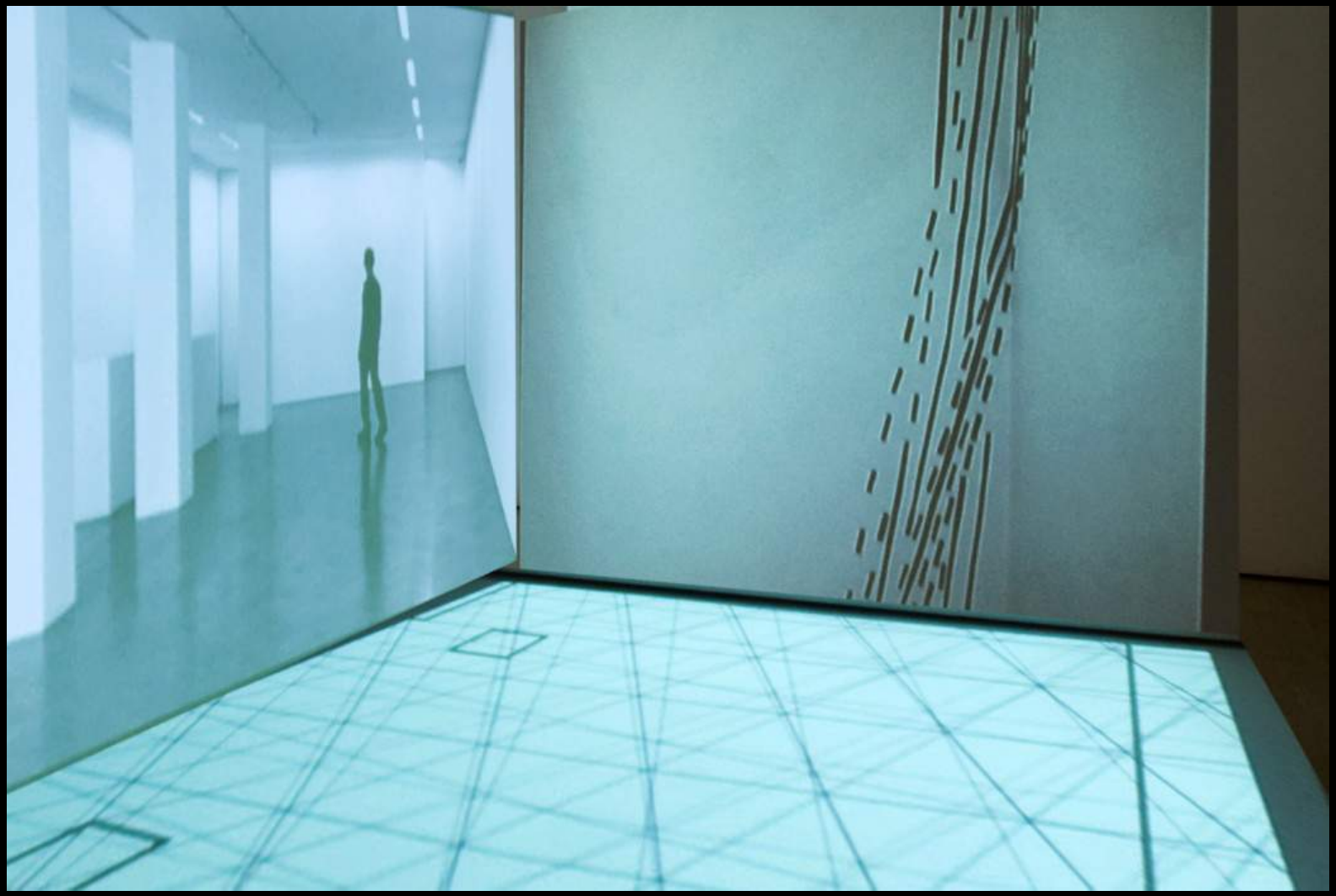

NEUROTOPOGRAPHICS

NEUROTOPOGRAPHICS

PATTERN COMPLETION


PATTERN COMPLETION


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Overview

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- Discuss the creative process that led to these installations
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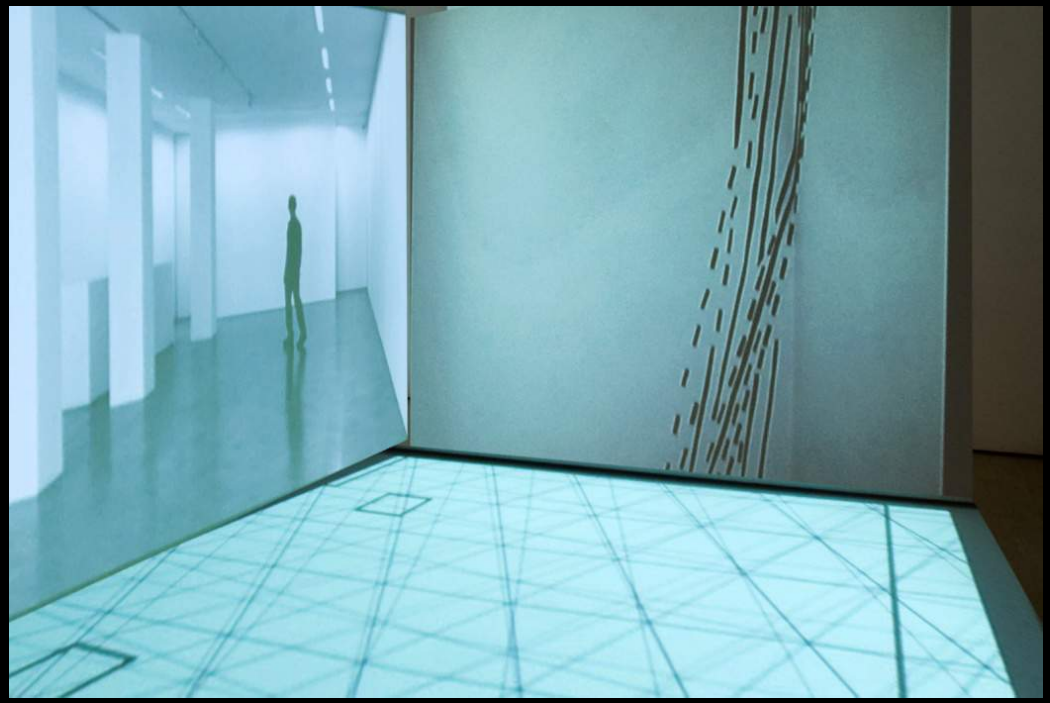
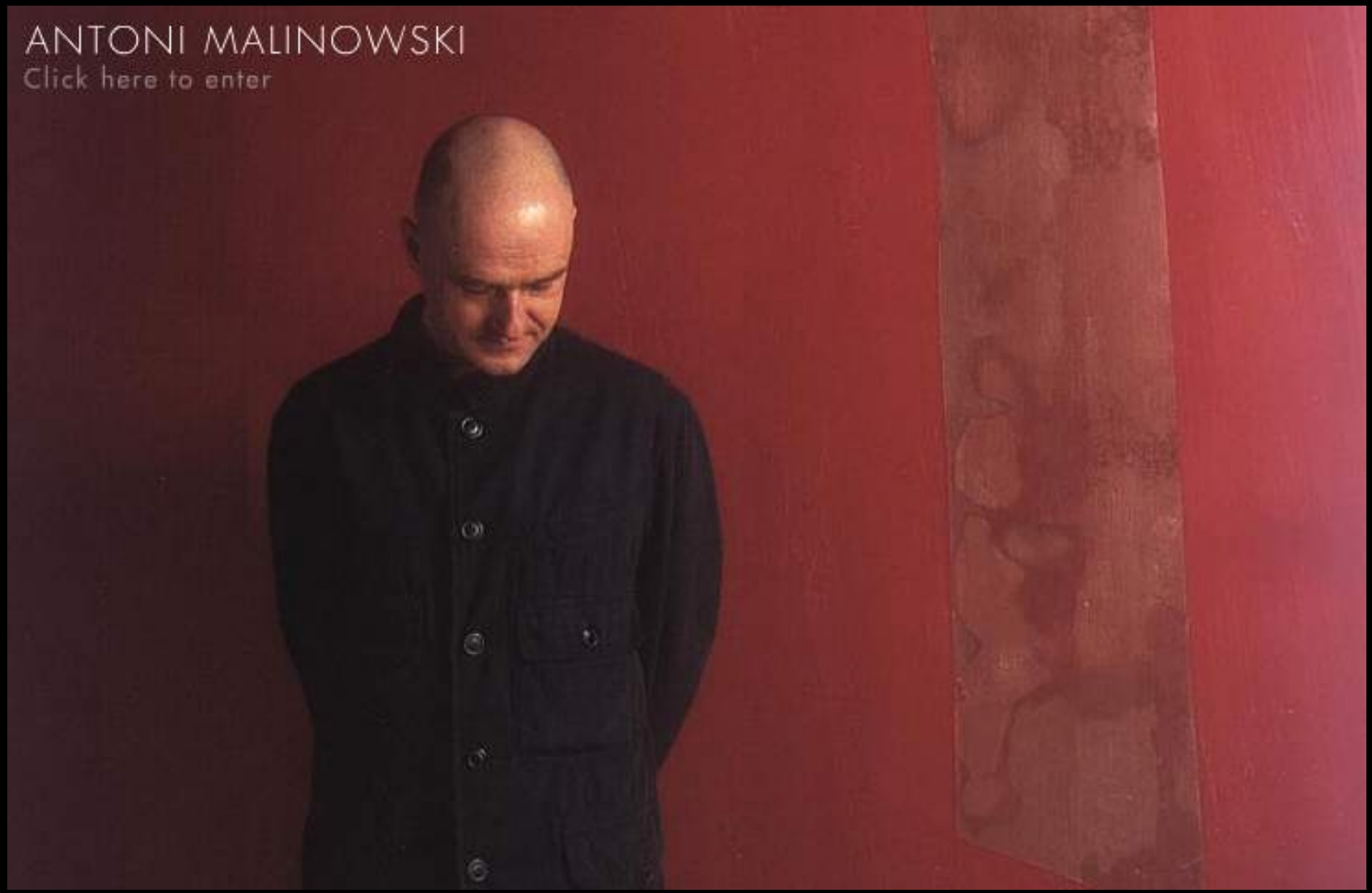
Neurotopographics



Gimpel Fils, Mayfair London


ANTONI MALINOWSKI
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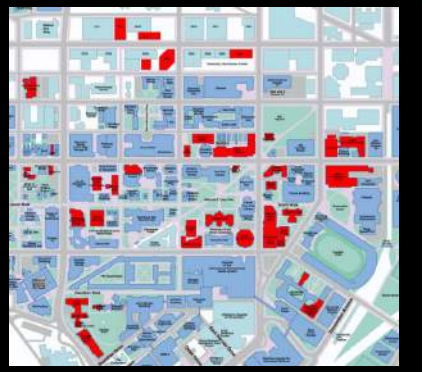


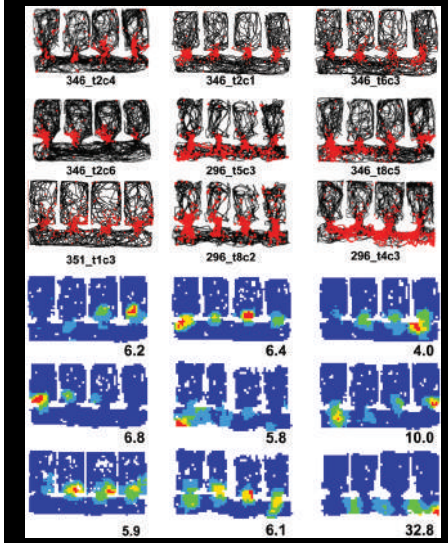


Figure 4. Intense activity around the doorways in 9 cells (plotted as for Fig. 3).

The Nobel Prize in Physiology or Medicine 2014

John O'Keefe

John O'Keefe discovered, in 1971, that certain nerve cells in the brain were activated when a rat assumed a particular place in the environment. Other nerve cells were activated at other places. He proposed that these "place cells" build up an inner map of the environment. Place cells are located in a part of the brain called the hippocampus.

Fig. 1

May-Britt Moser and Edvard I. Moser

May-Britt och Edvard I. Moser discovered in 2005 that other nerve cells in a nearby part of the brain, the entorhinal cortex, were activated when the rat passed certain locations. Together, these locations formed a hexagonal grid, each "grid cell" reacting in a unique spatial pattern. Collectively, these grid cells form a coordinate system that allows for spatial navigation.

Fig. 2

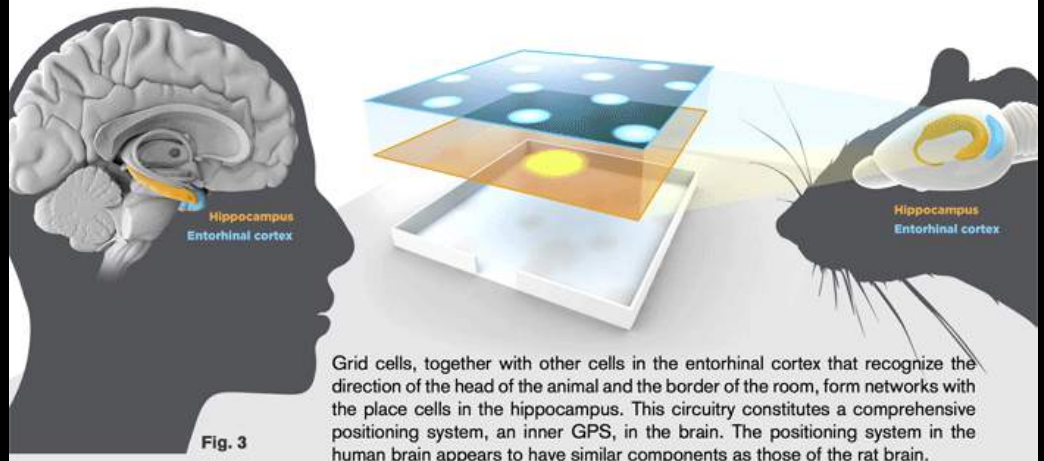
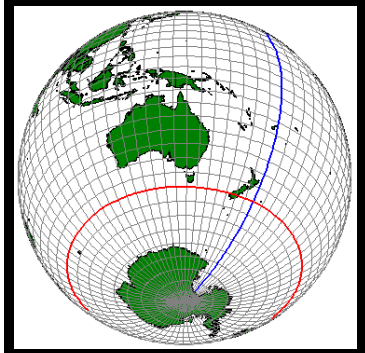
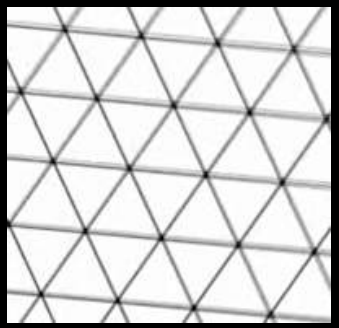


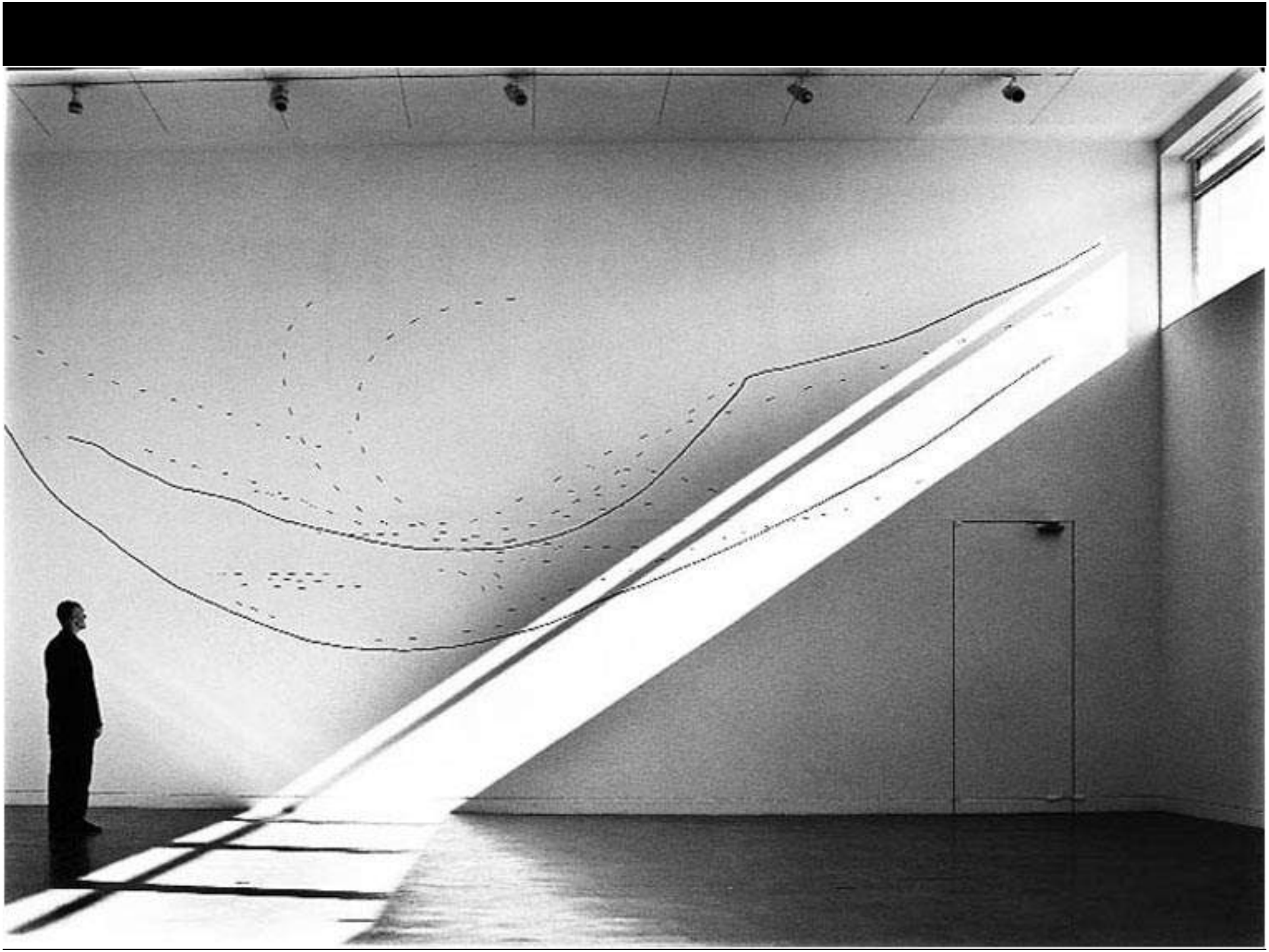
Fig. 3

Grid cells, together with other cells in the entorhinal cortex that recognize the direction of the head of the animal and the border of the room, form networks with the place cells in the hippocampus. This circuitry constitutes a comprehensive positioning system, an inner GPS, in the brain. The positioning system in the human brain appears to have similar components as those of the rat brain.

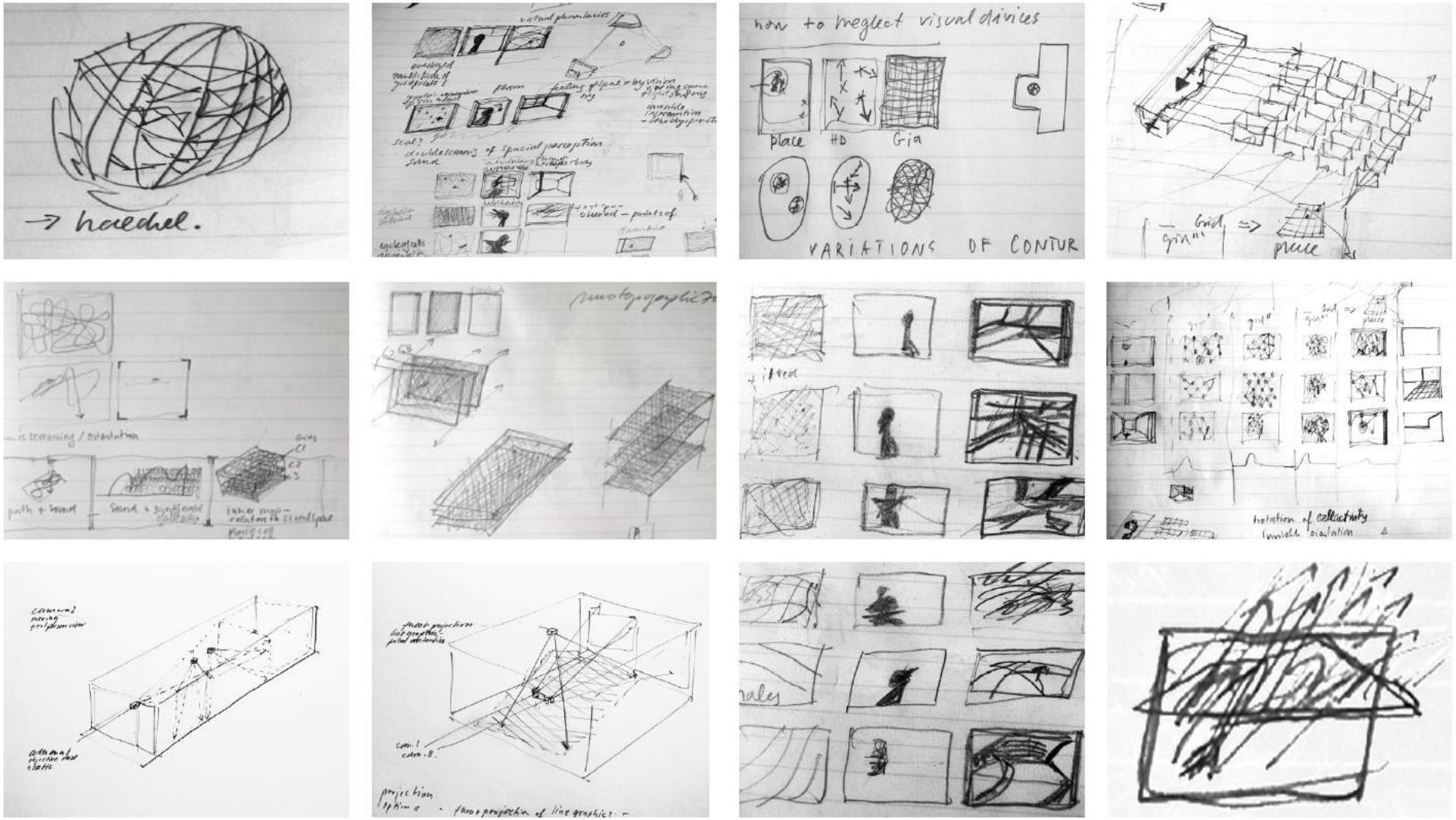
Illustration and layout: Mattias Karlén





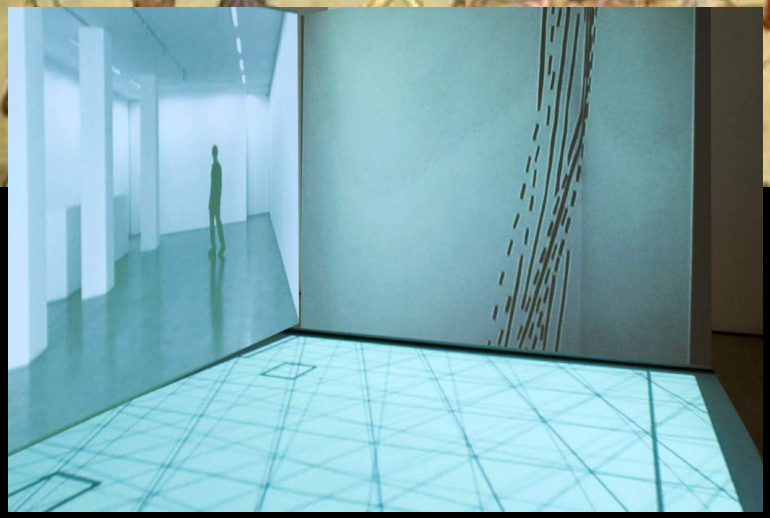


Bettina Vismann

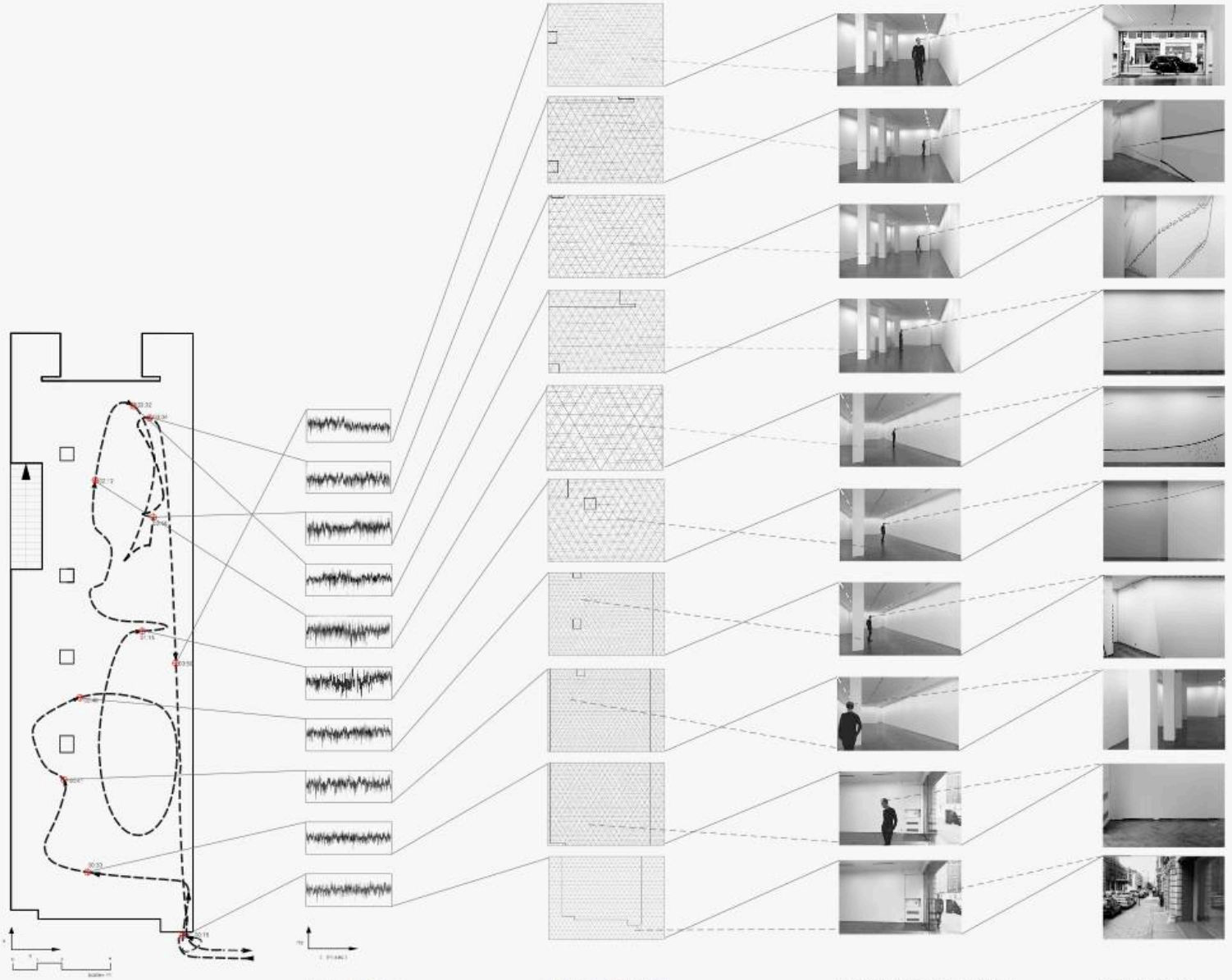


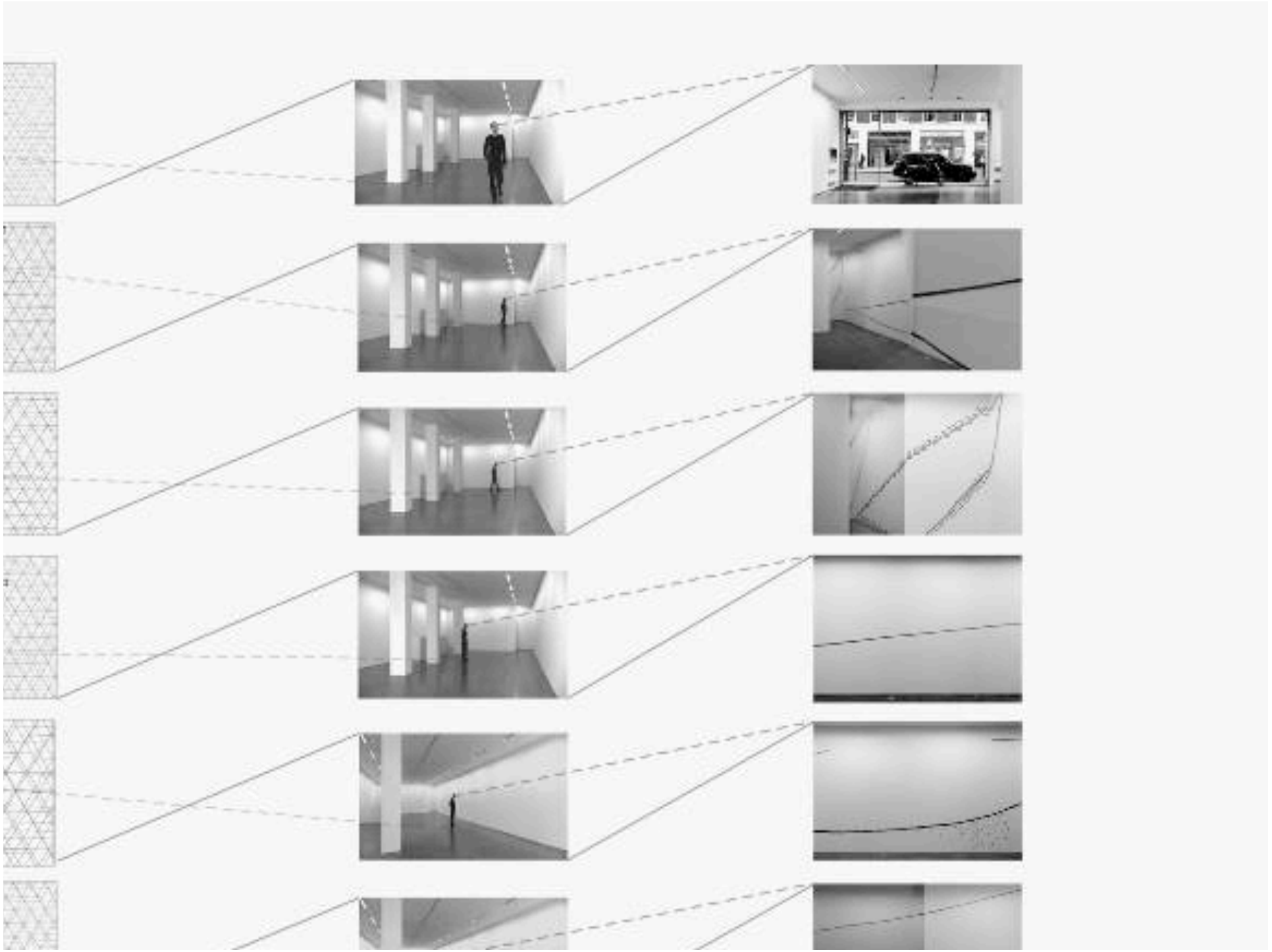
Development drawings by Bettina Vismann

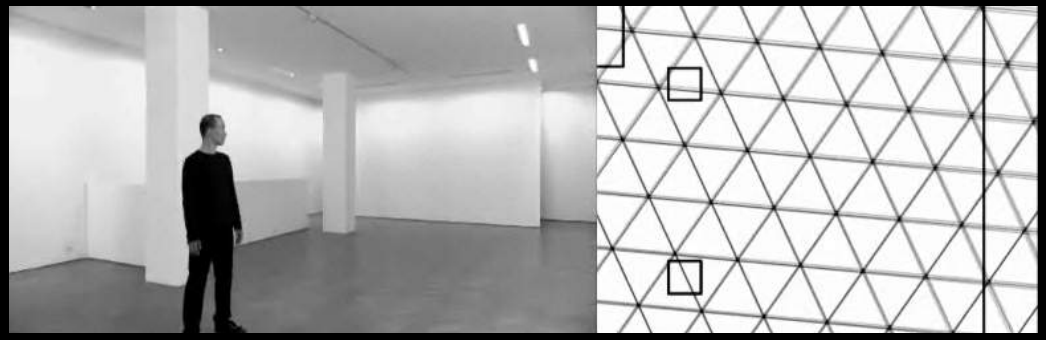
Lilliputian Delusions



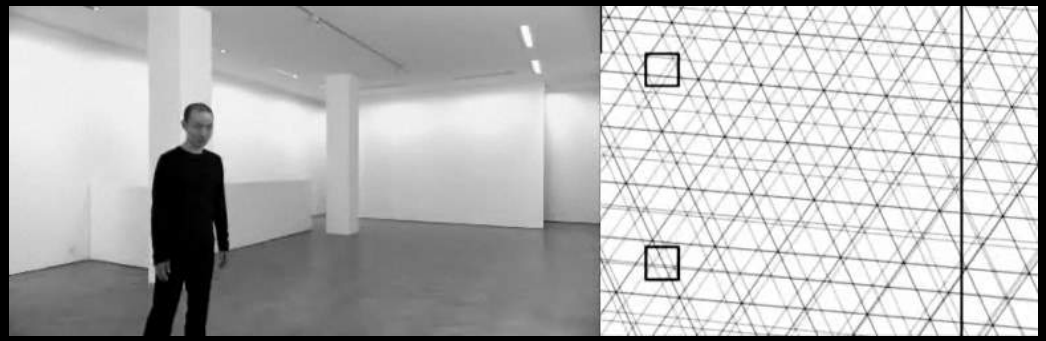
Alice in wonderland syndrome


theta - oscillation
animation / cellactivity
objective shot / allocentric view
first person view

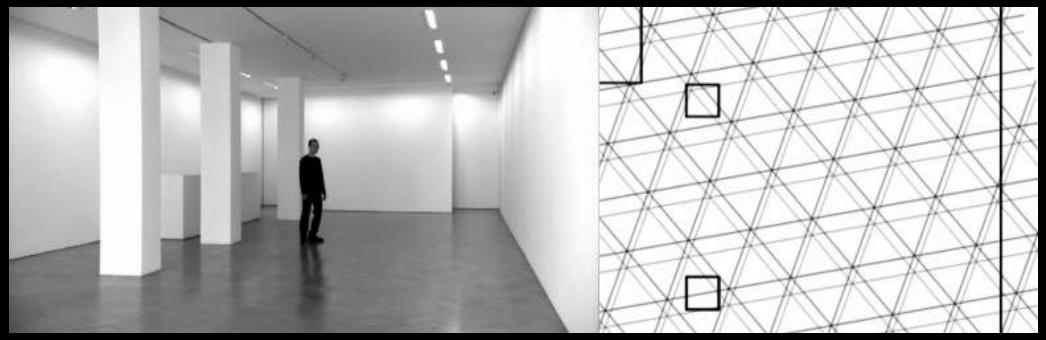




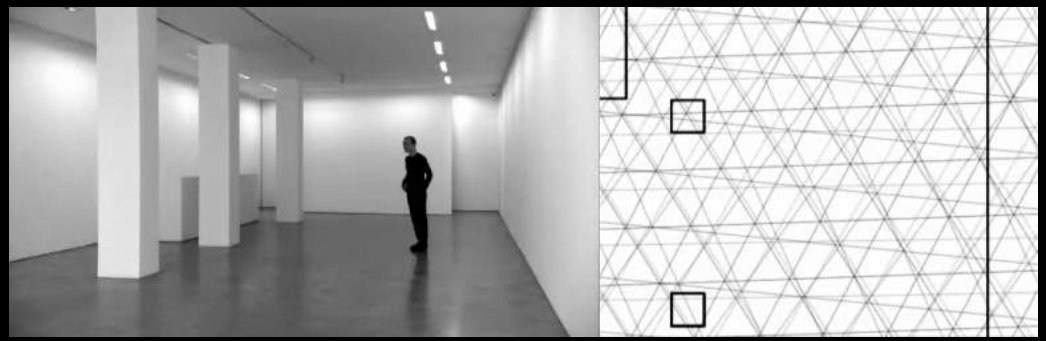
Mapping the space



The map stretches



Re-mapping the space



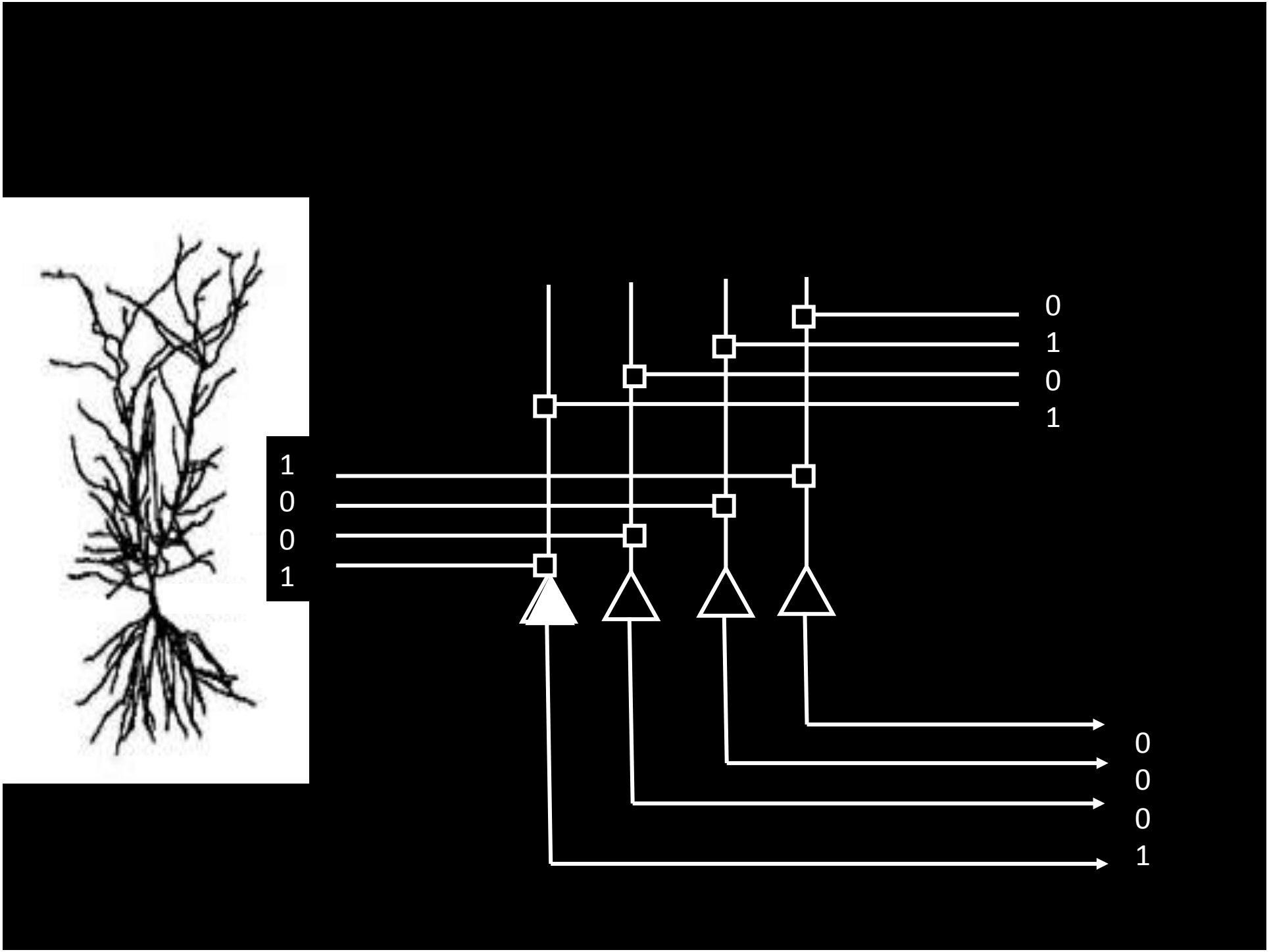
Un-anchoring from the space

Pattern Completion

Michela Nettell

Tom Simmons

Pattern Completion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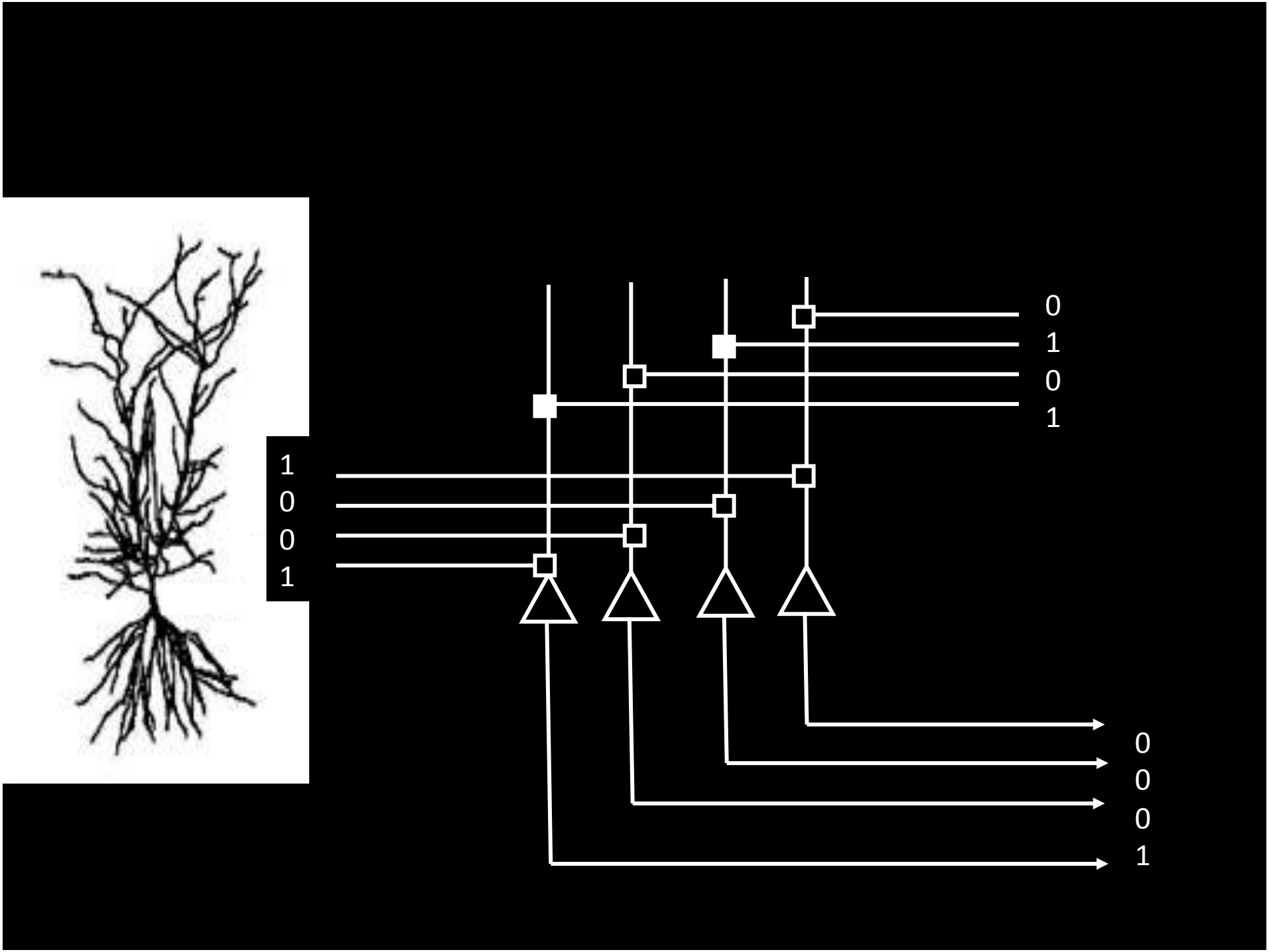
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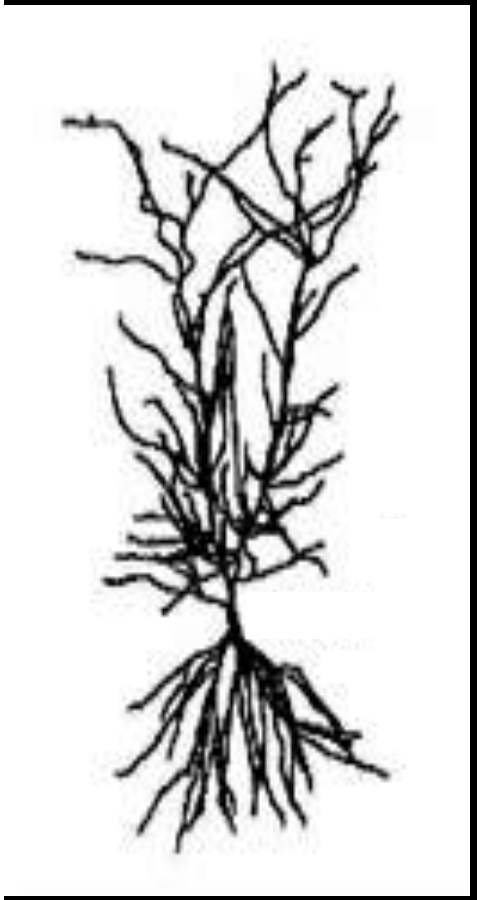

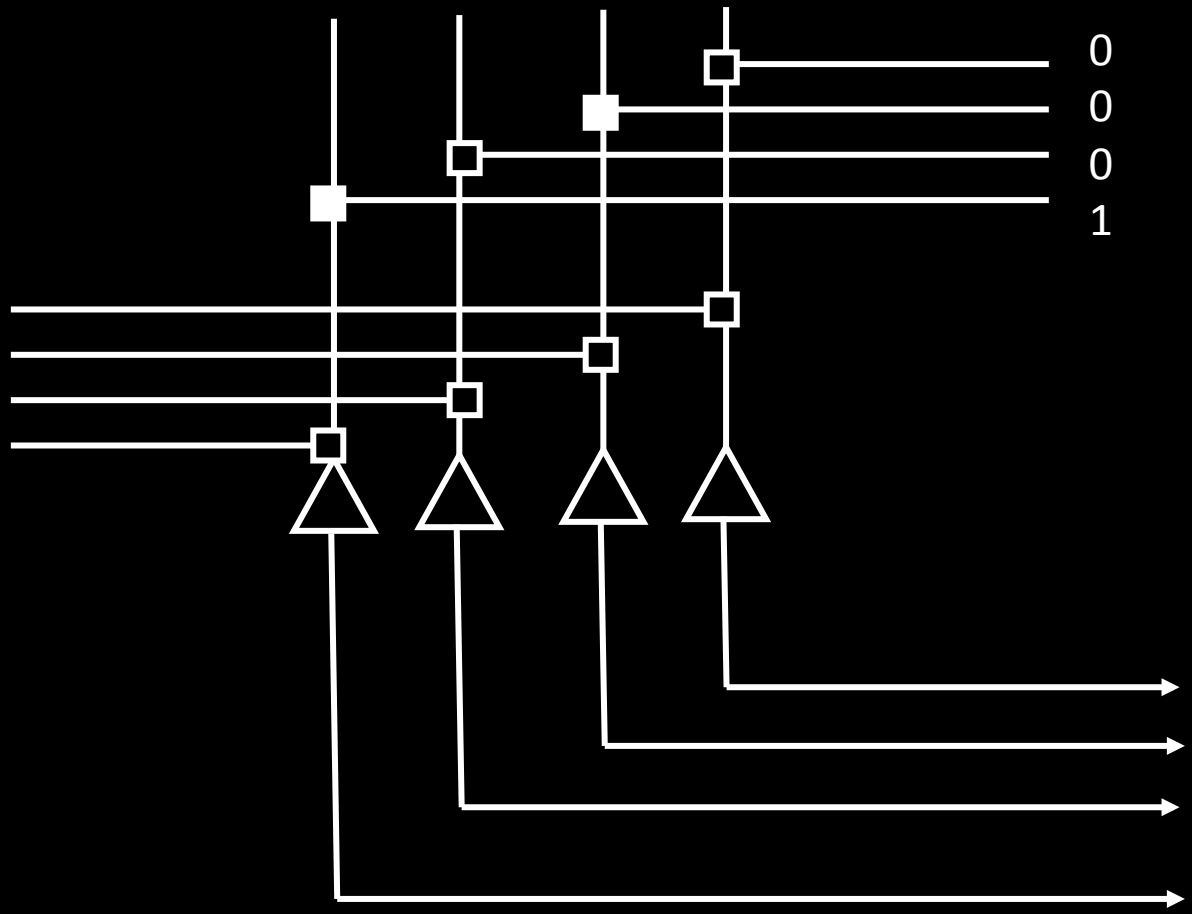
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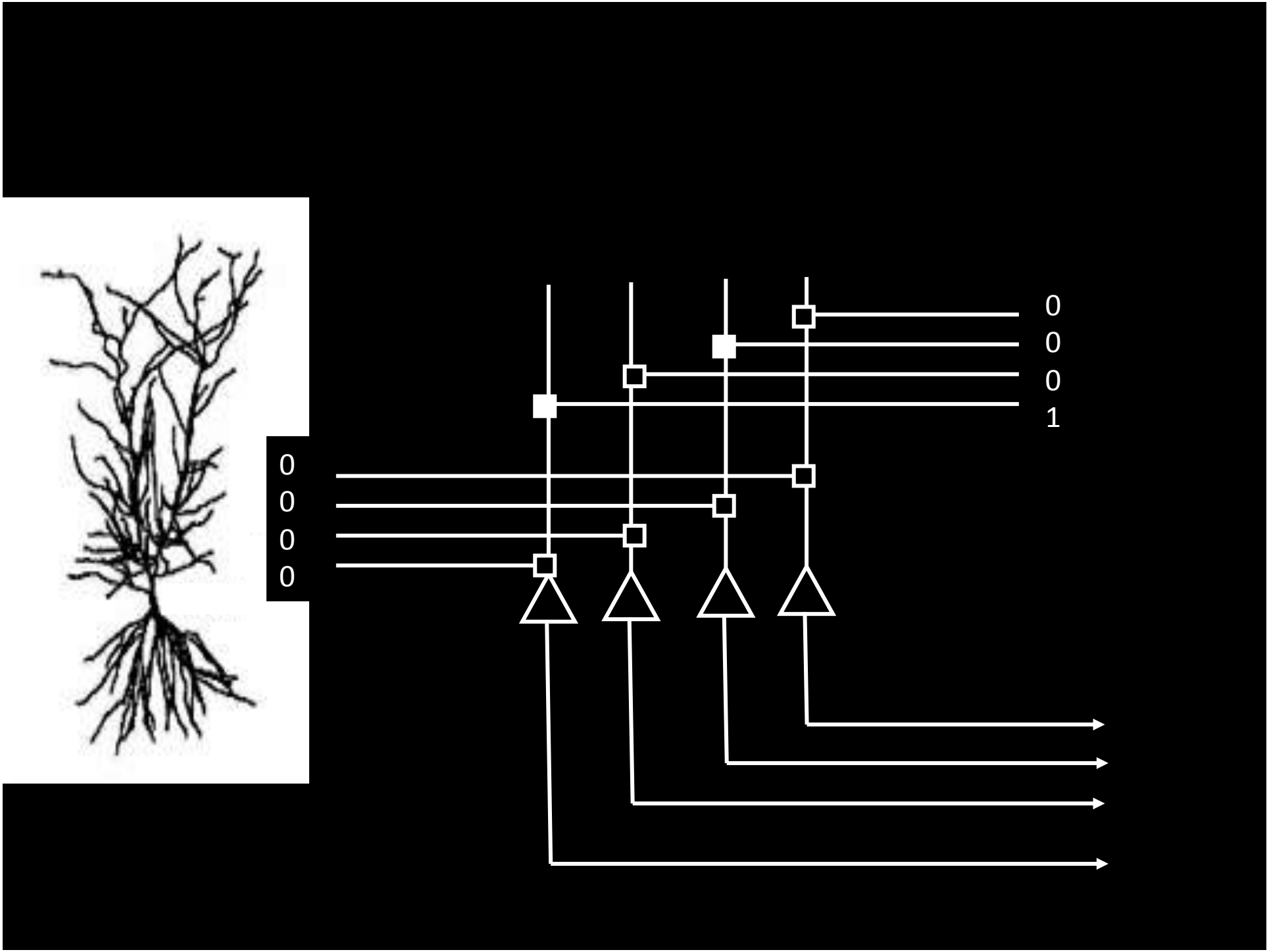
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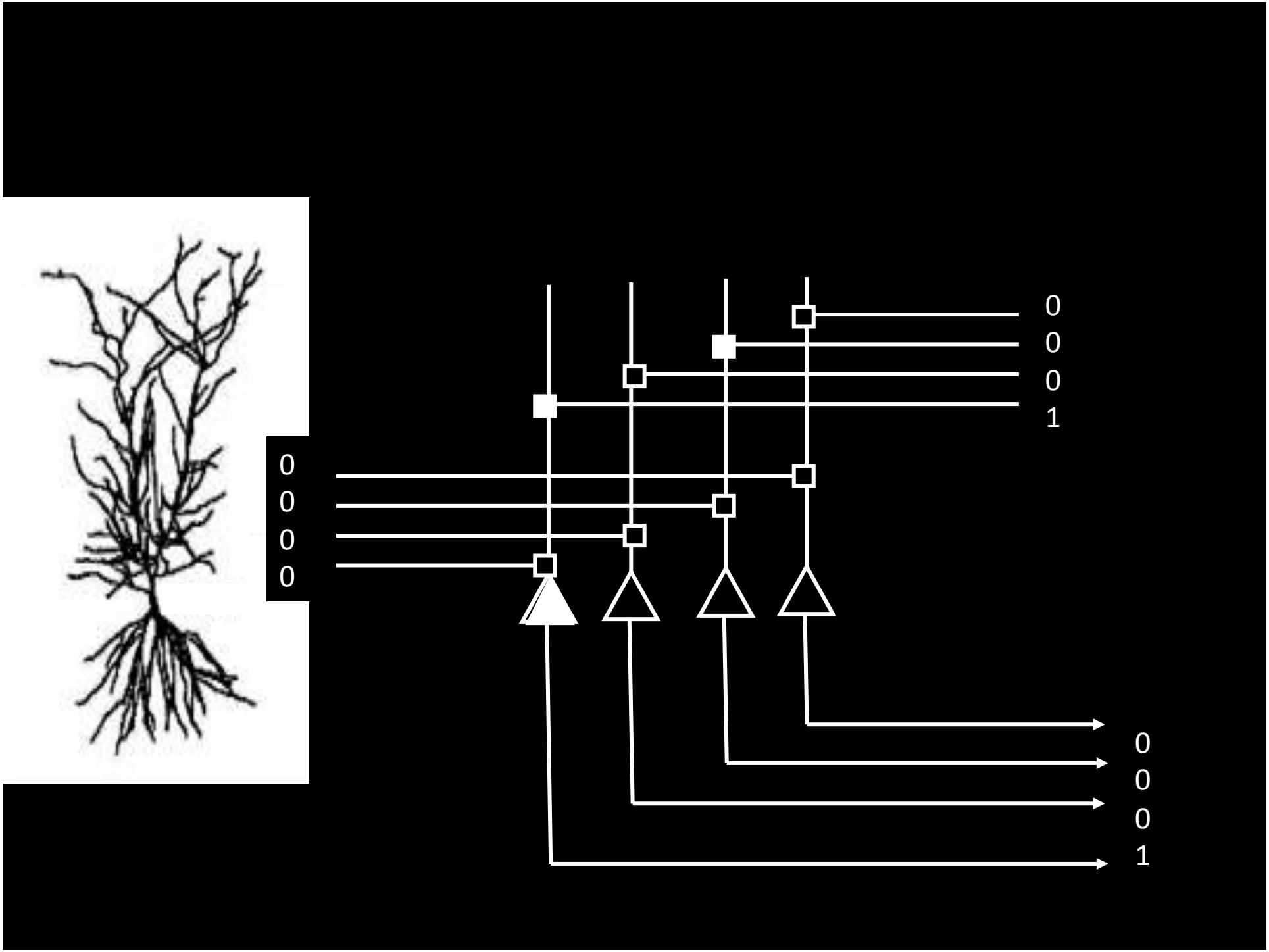
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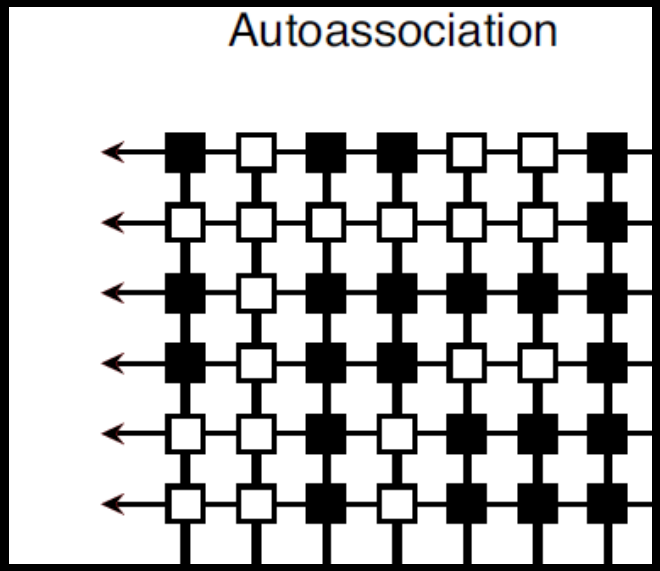
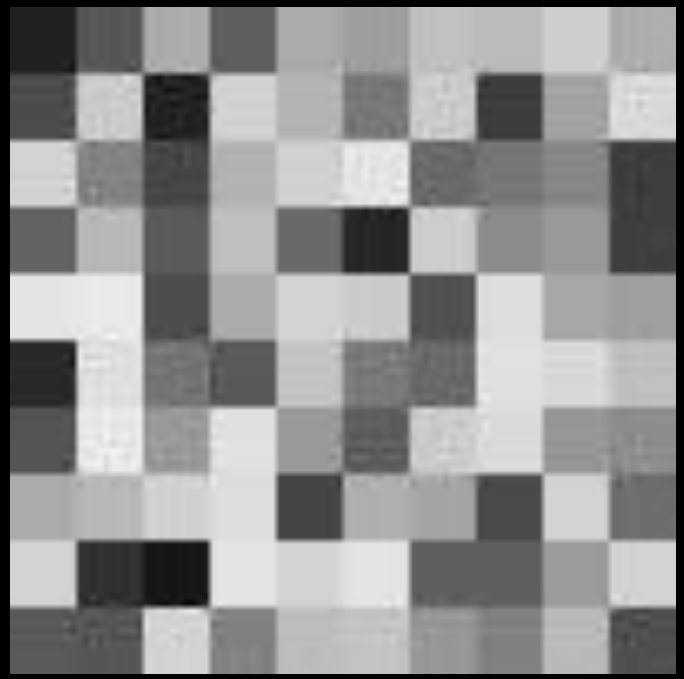
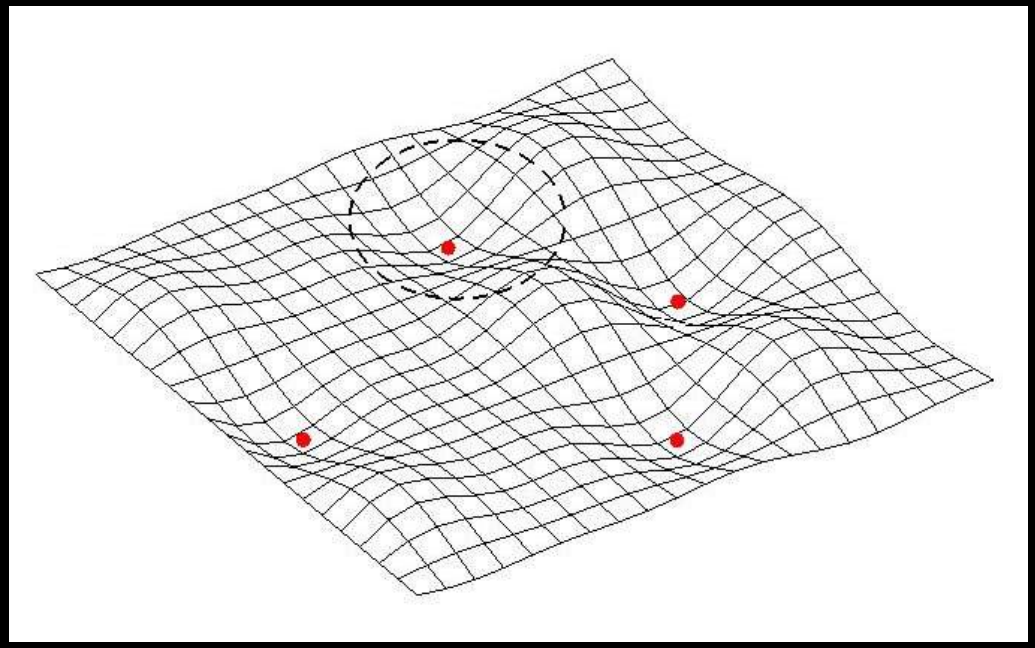
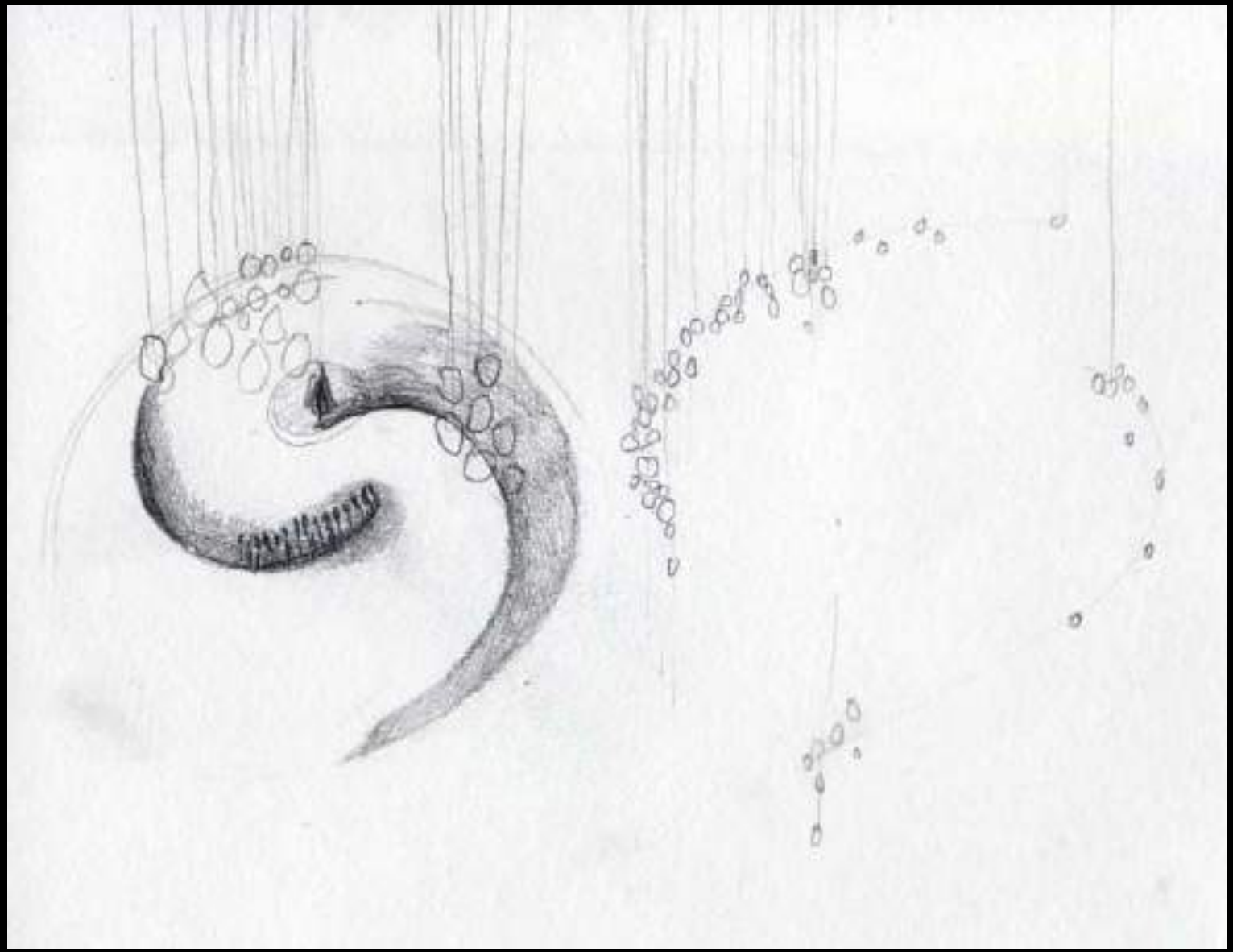
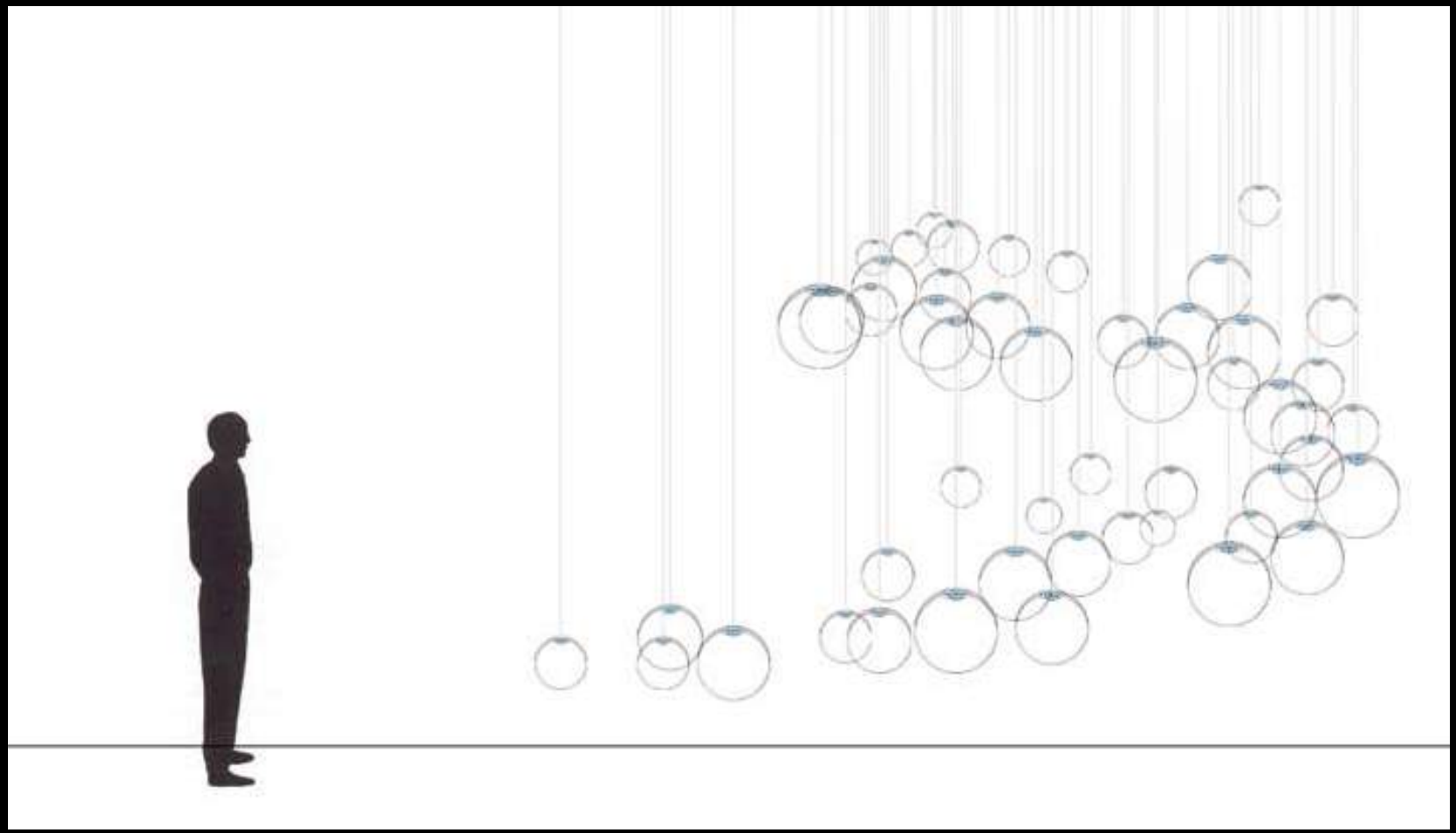

Autoassociation





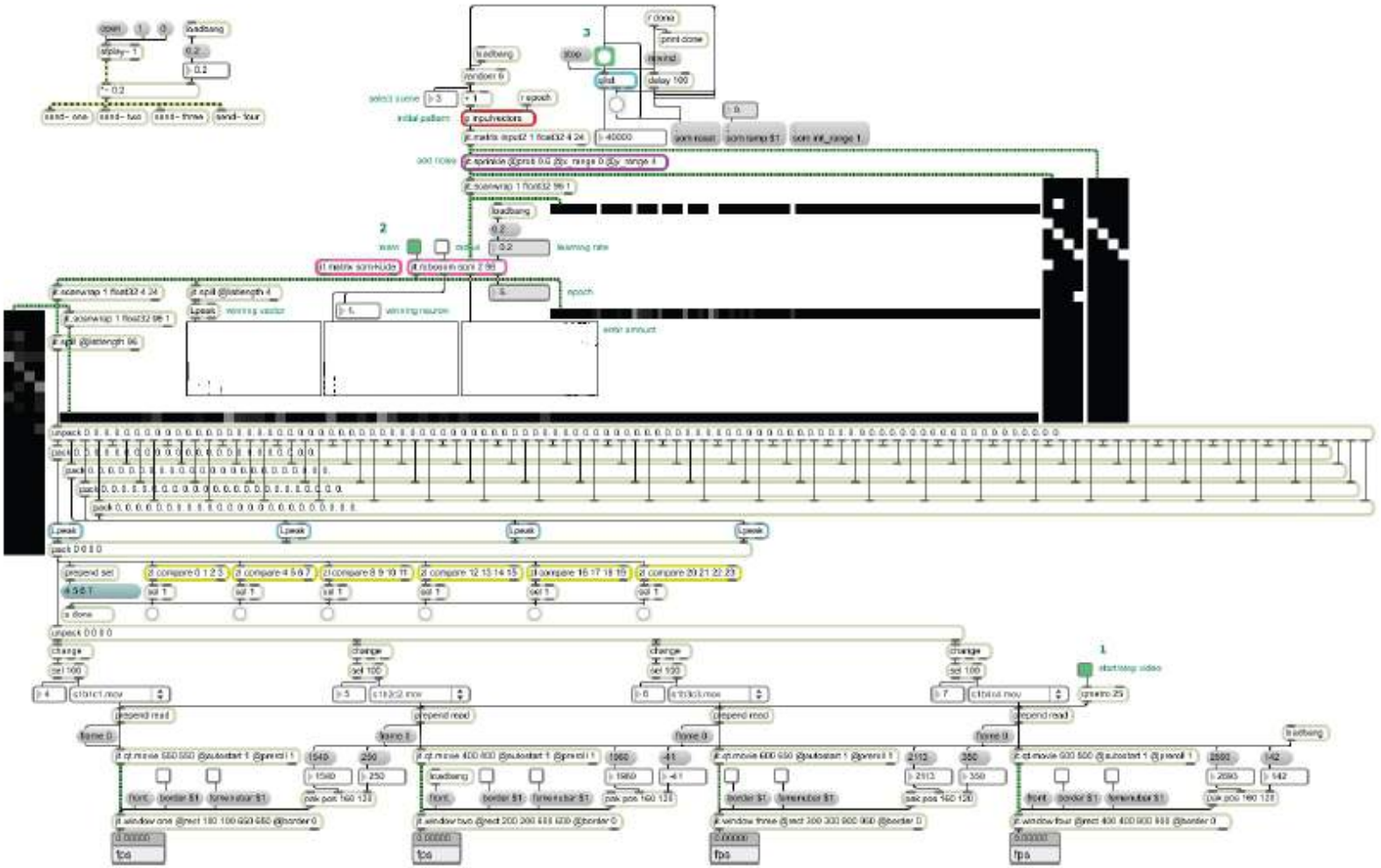





PATTERN COMPLETION

Pattern Completion

MaxMSP program used to determine sound and image playback

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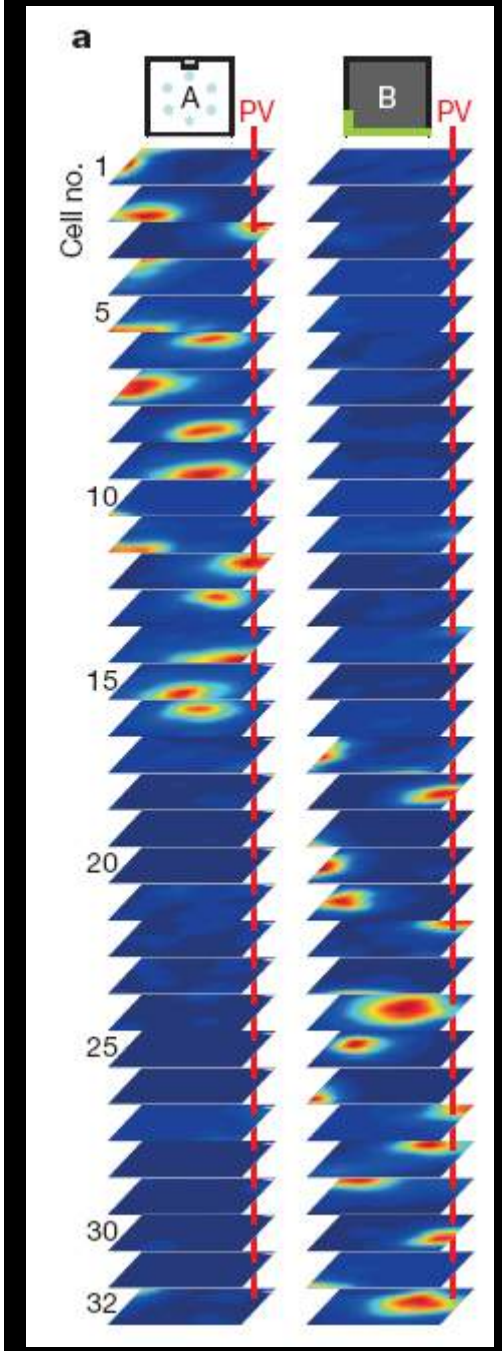
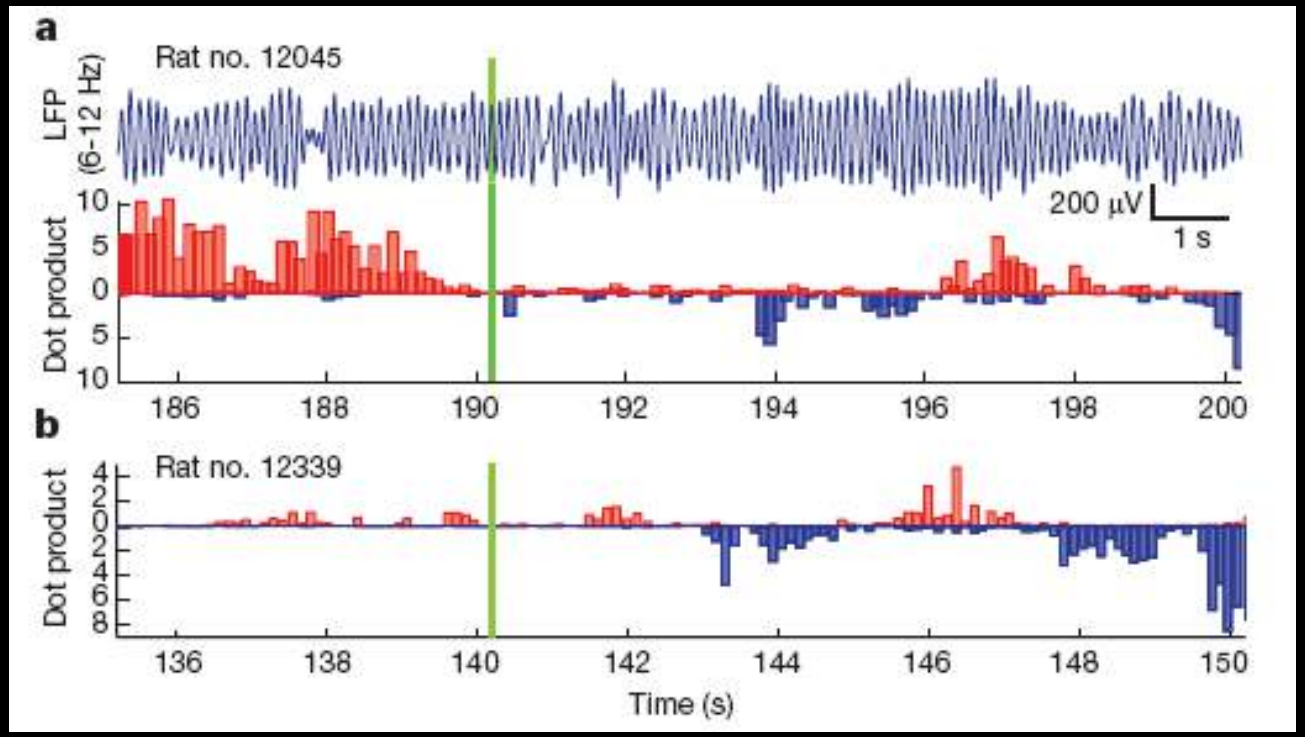
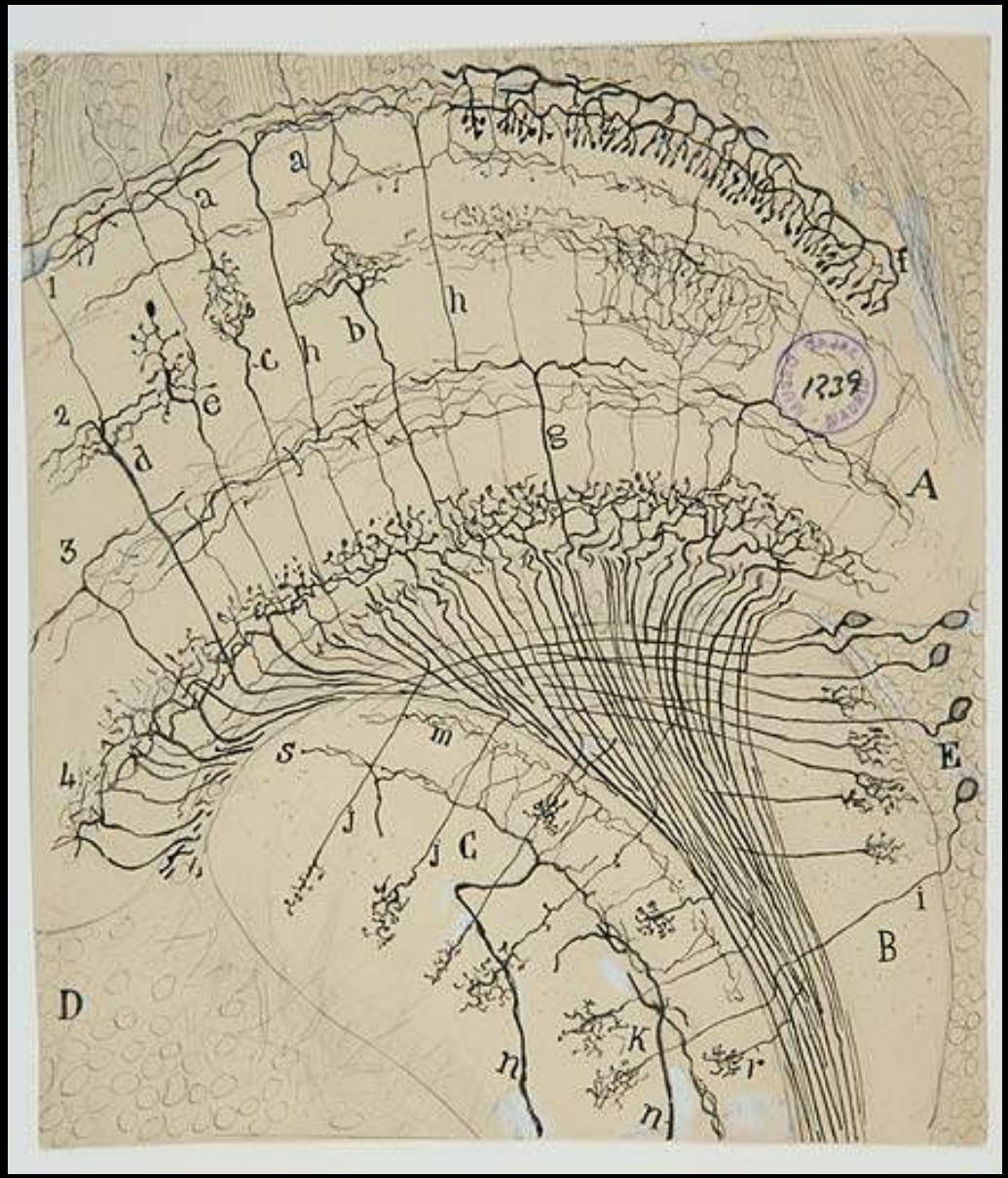




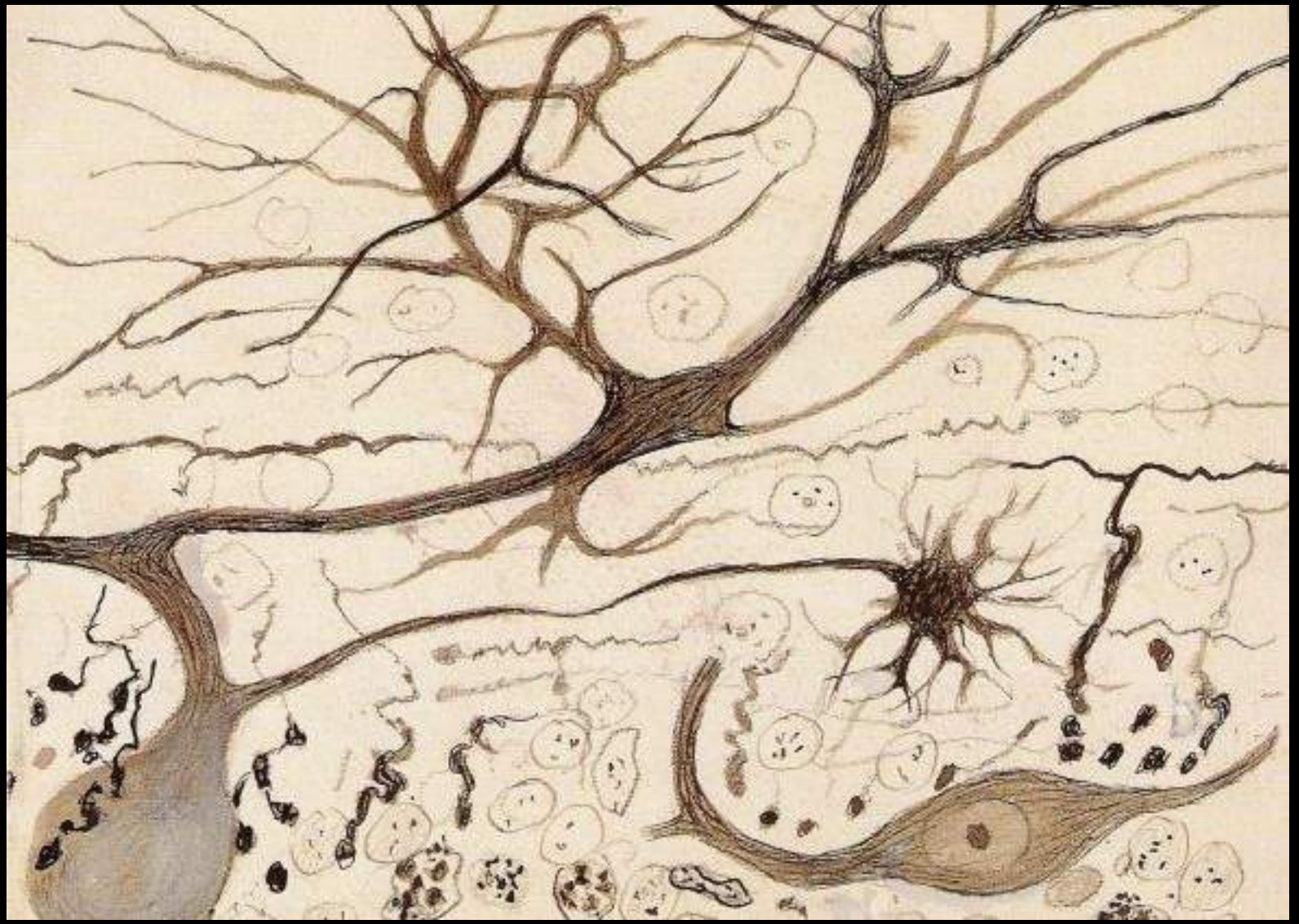
Jezek et al 2011 Nature

Overview

- Introduce two installations
- Discuss the creative process that led to these installations
- How does this work relate to other visual art works exploring neuroscience topics
- Do painters, sculptors and architects think differently about space?



Drawing by Santiago Ramon J Cajal



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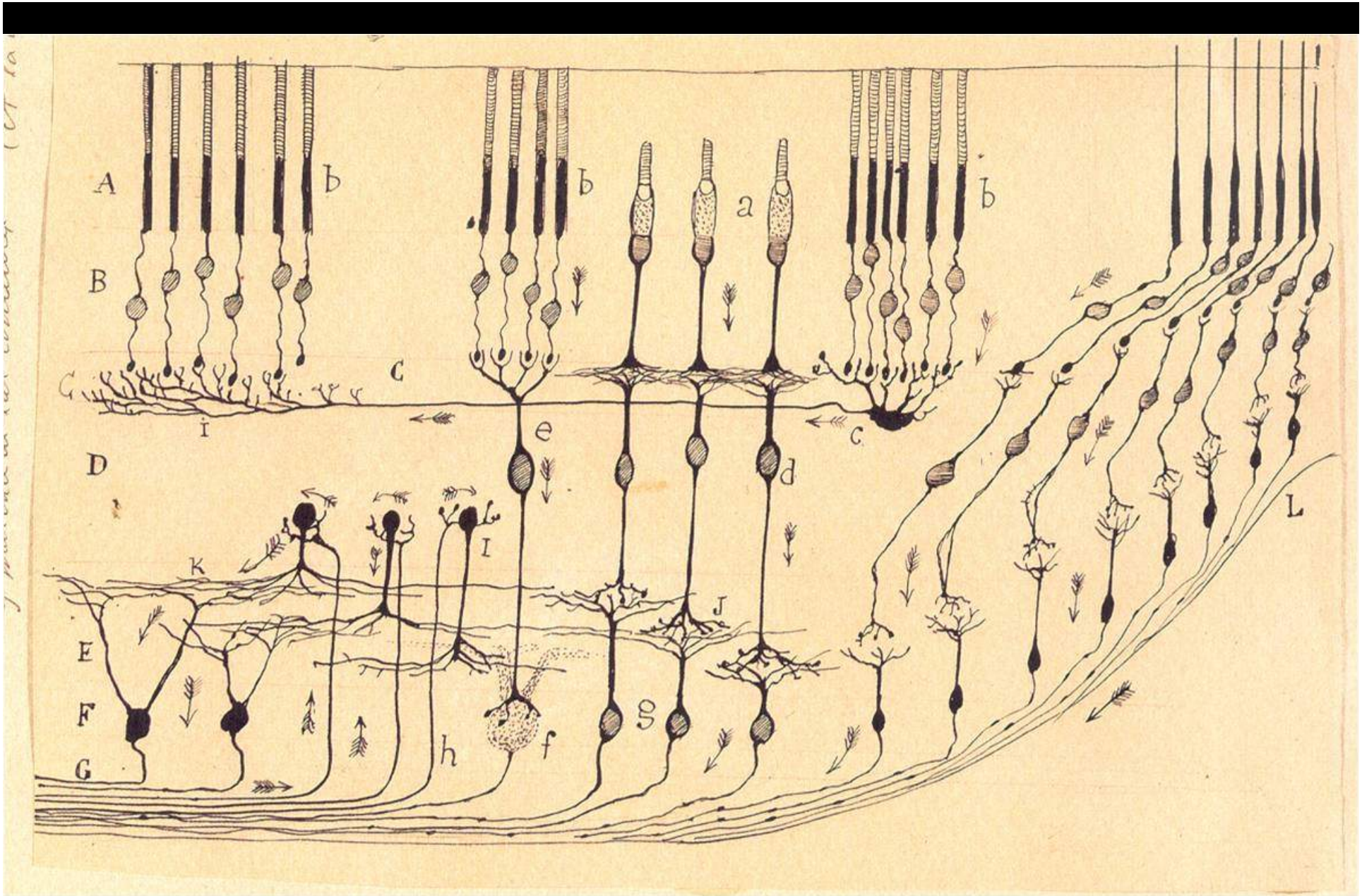
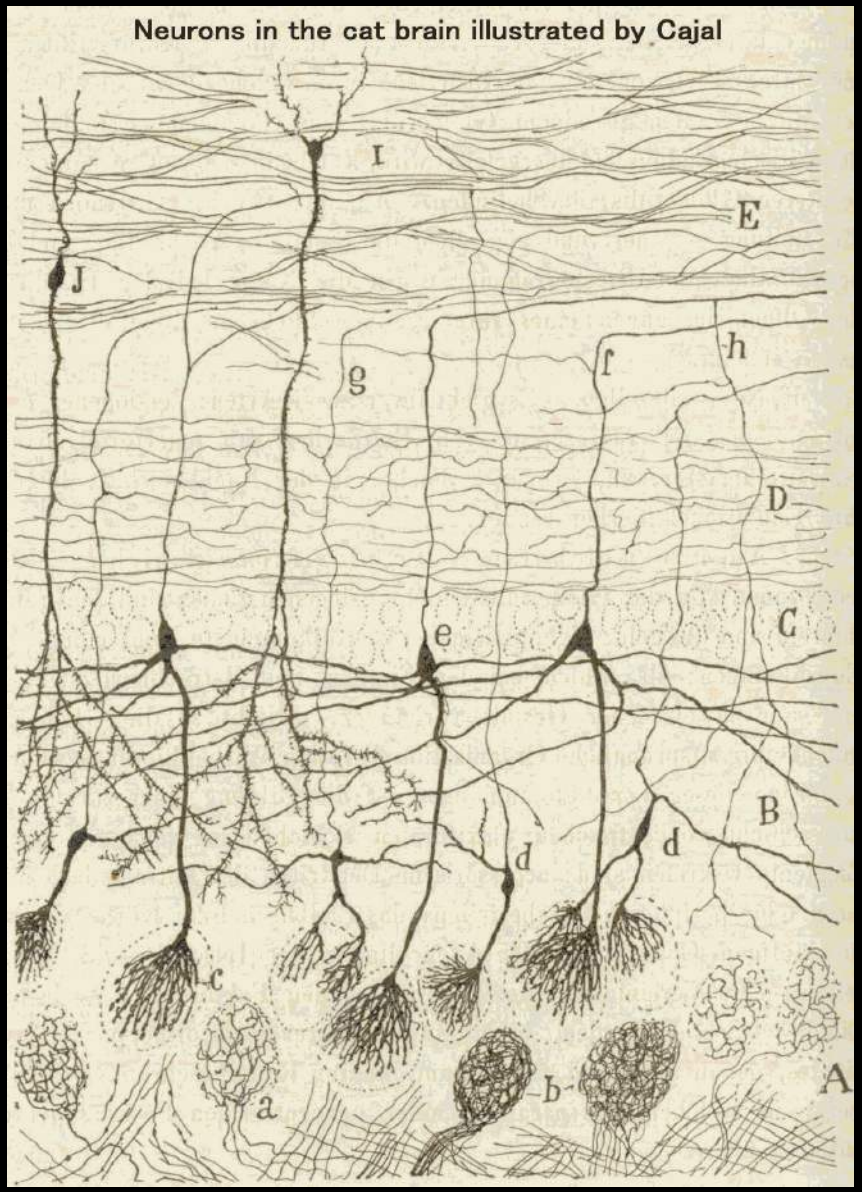
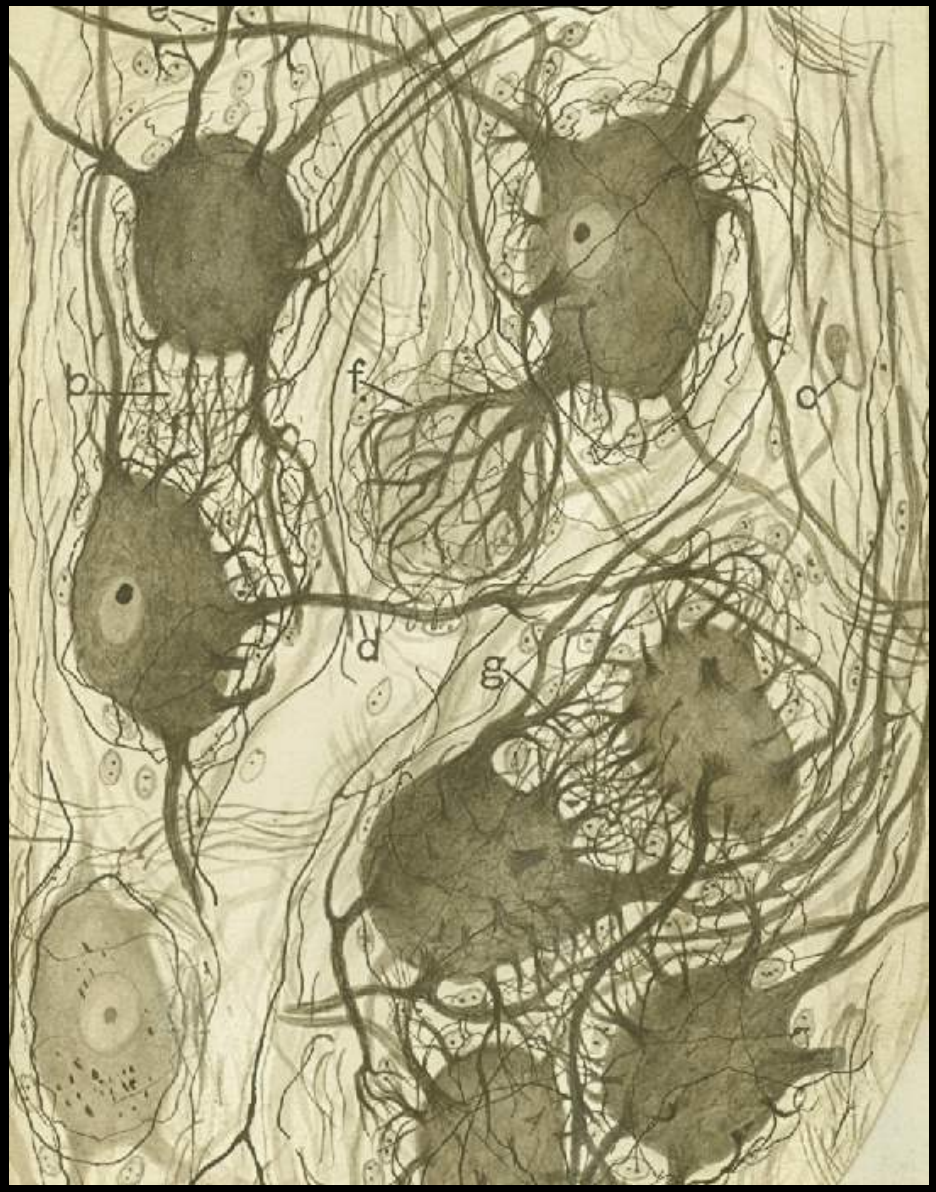


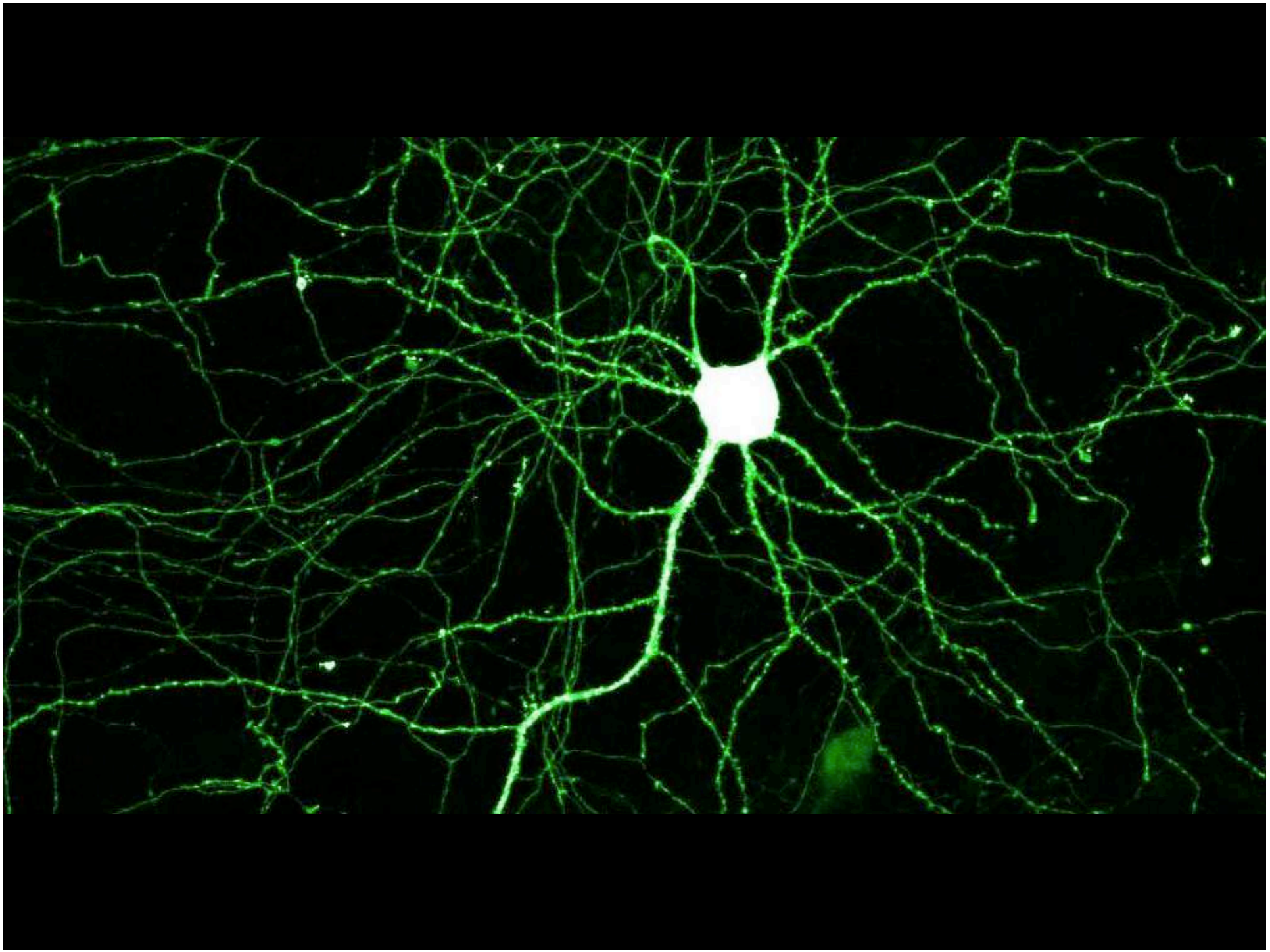
Drawing by Santiago Ramon J Cajal



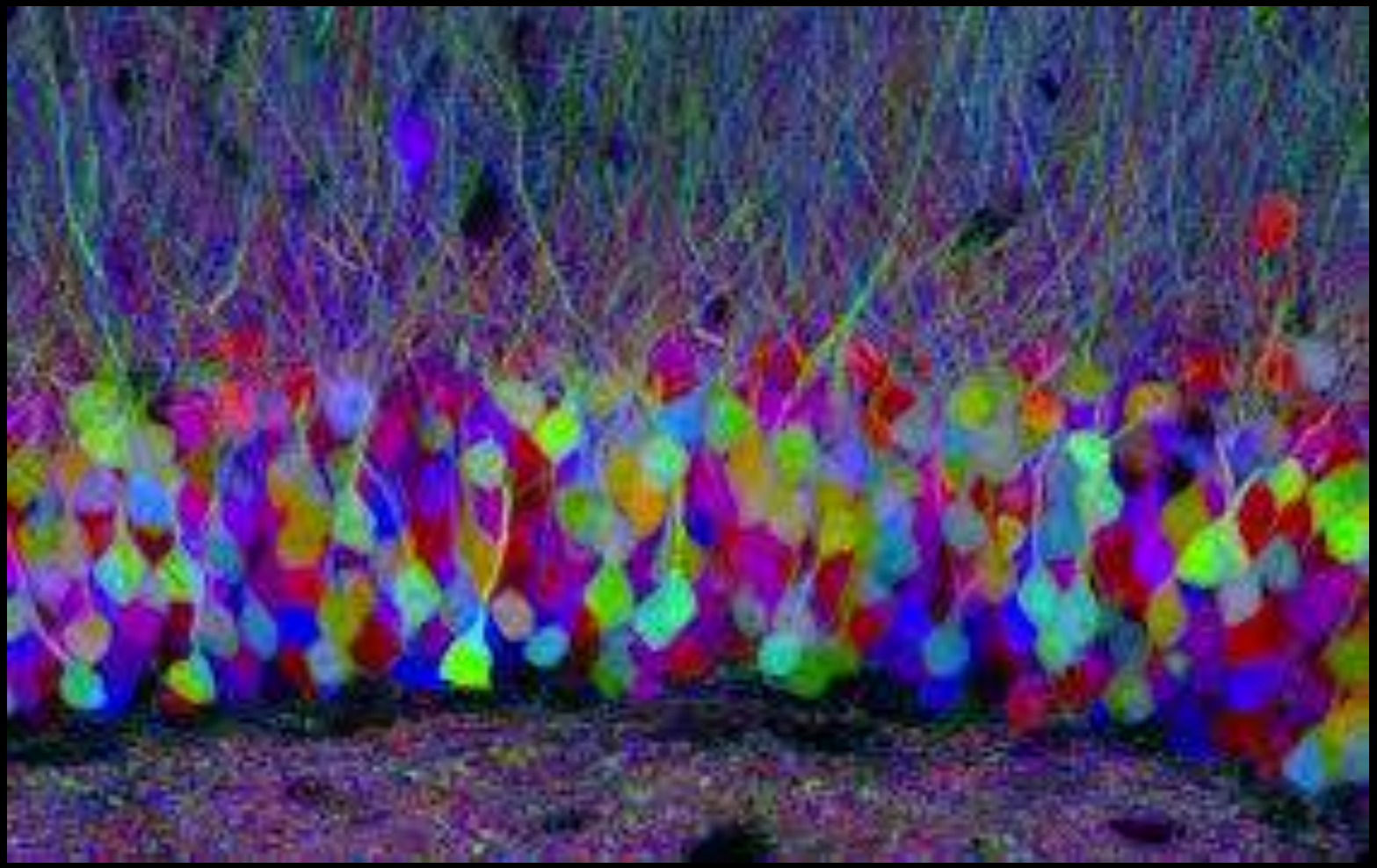


Drawing by Santiago Ramon J Cajal

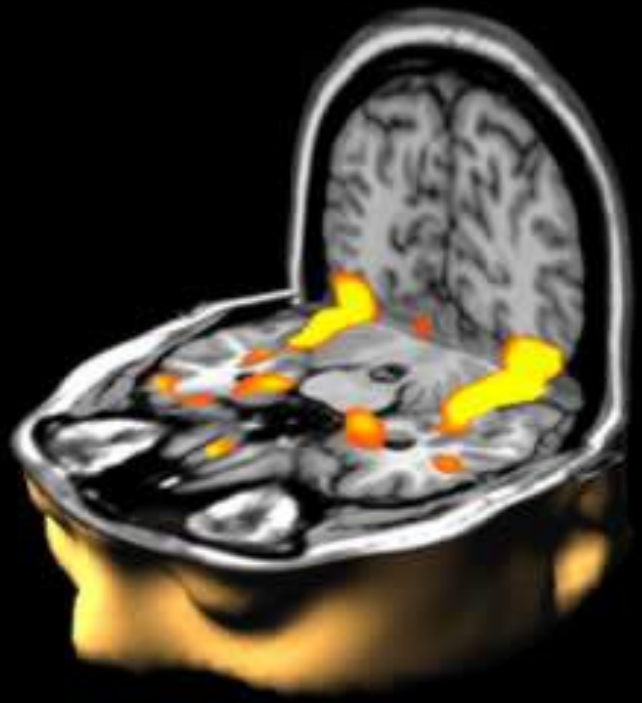
Two Pyramidals - Greg Dunn



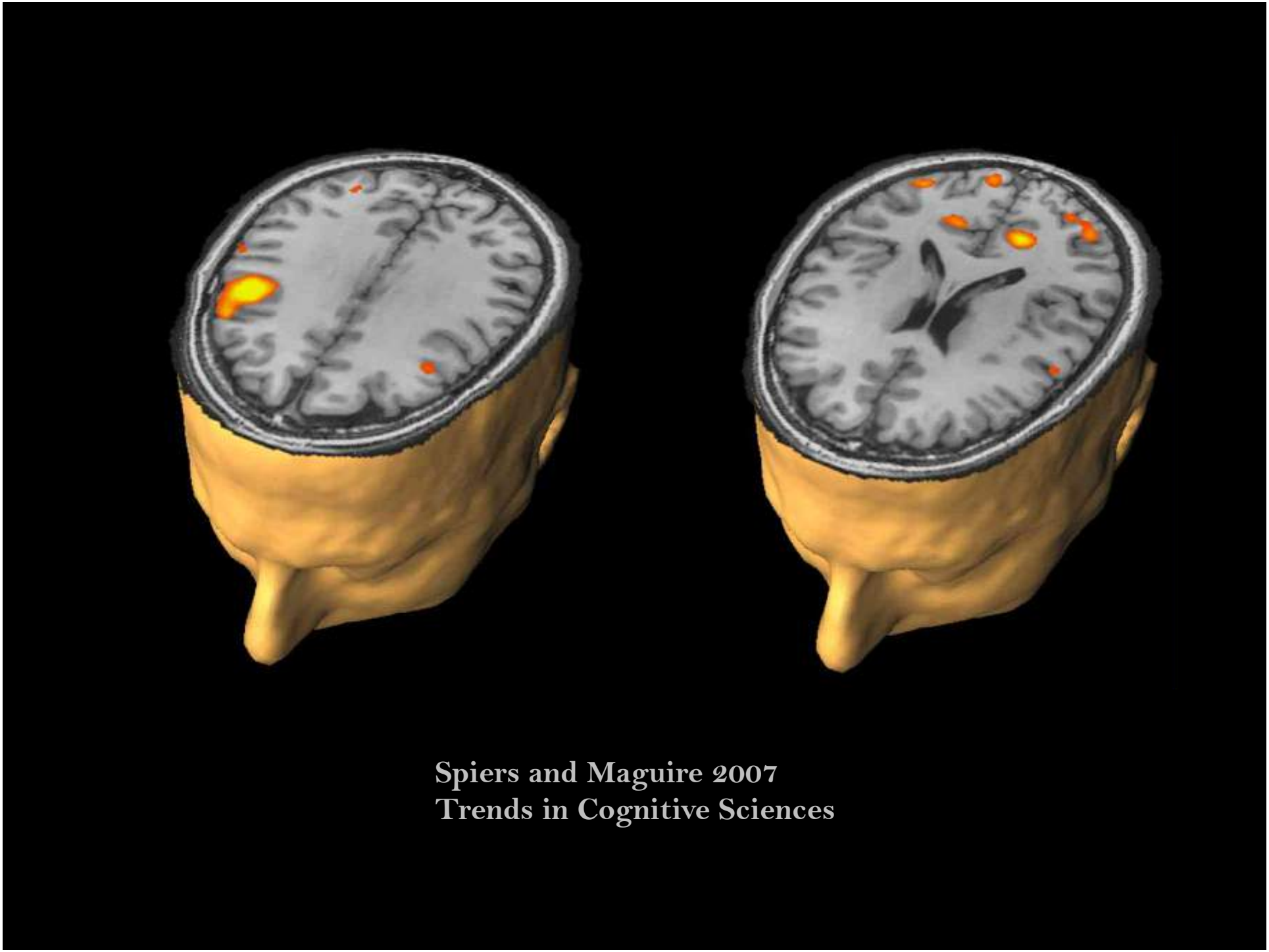
Magic Forest – 2002 – Andrew Carnie (science museum London)



Brainbow Mouse Hippocampus

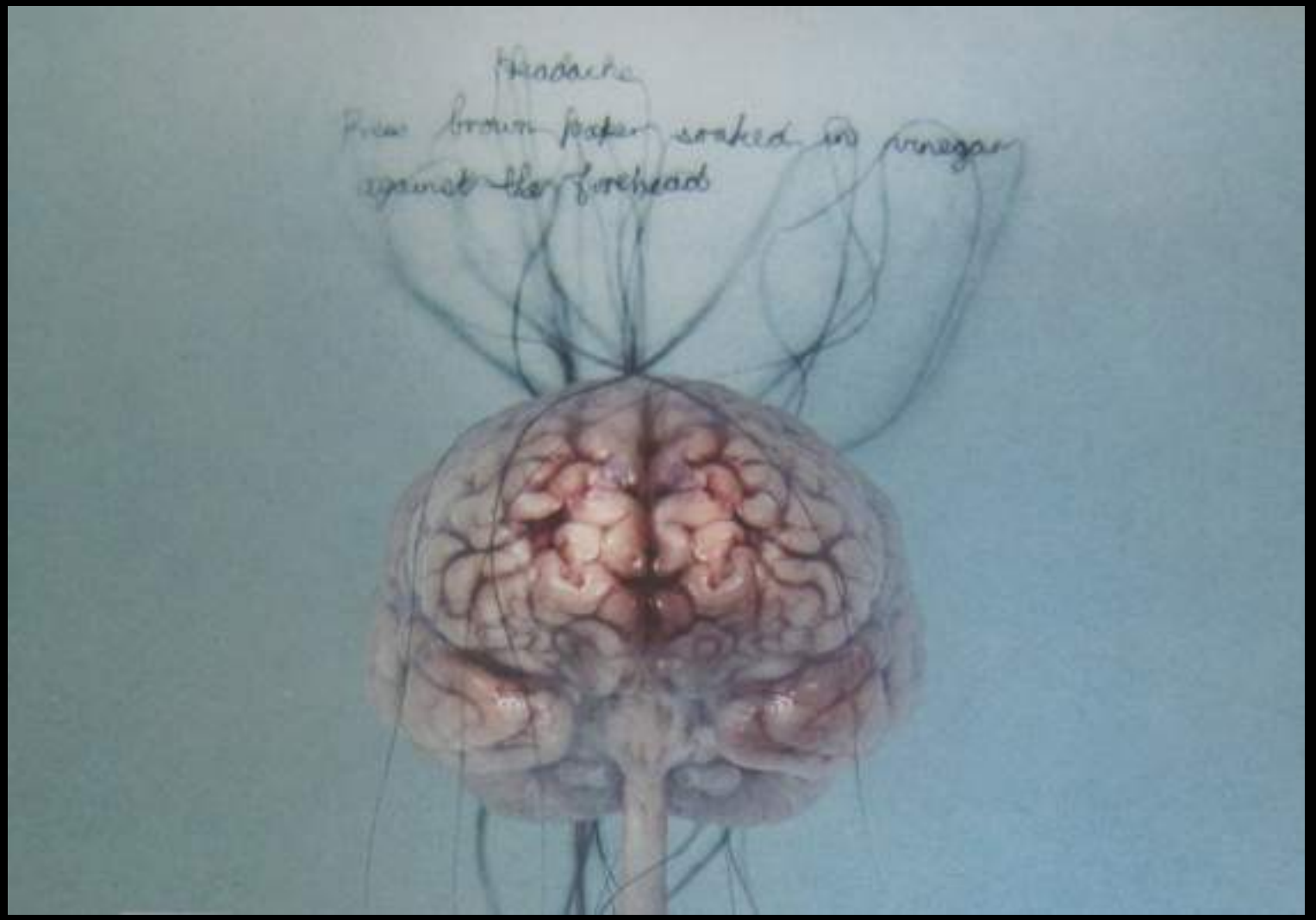


Winning image from the Wellcome Trust Biomedical Image Award in 2003 (Mark Lythgoe and Chloe Hutton). Novartis / Daily Telegraph award 2003

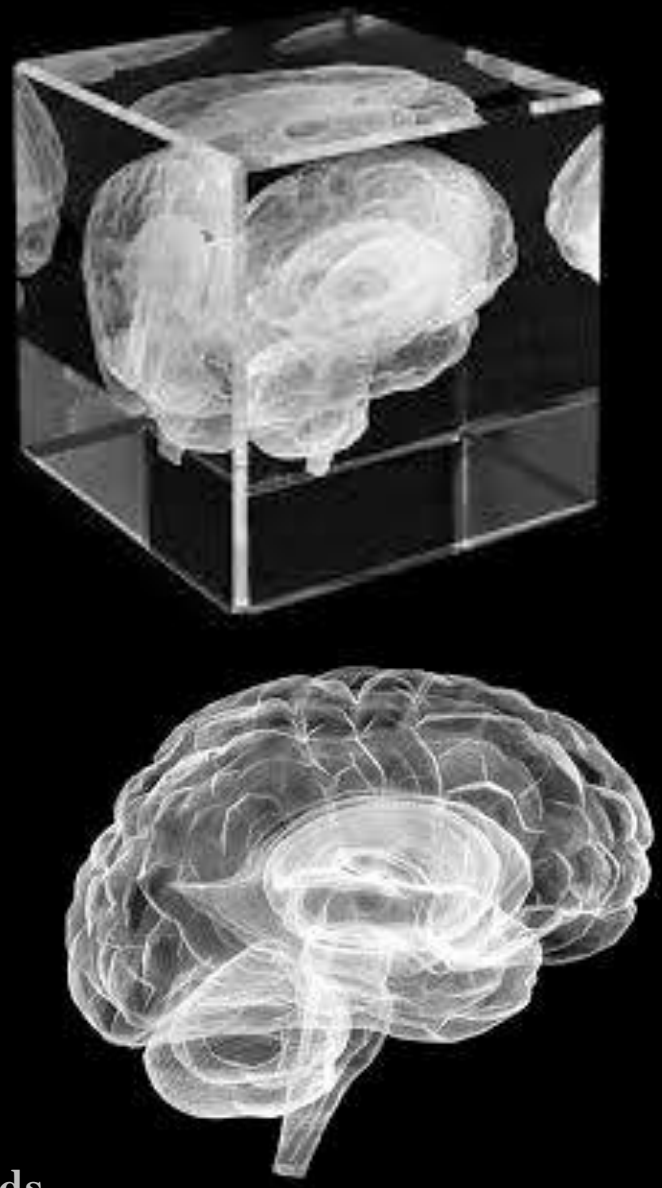


Spiers and Maguire 2007
Trends in Cognitive Sciences


wellcome collection
BRAINS
The Mind as Matter
29 March–17 June
www.wellcomecollection.org/brains

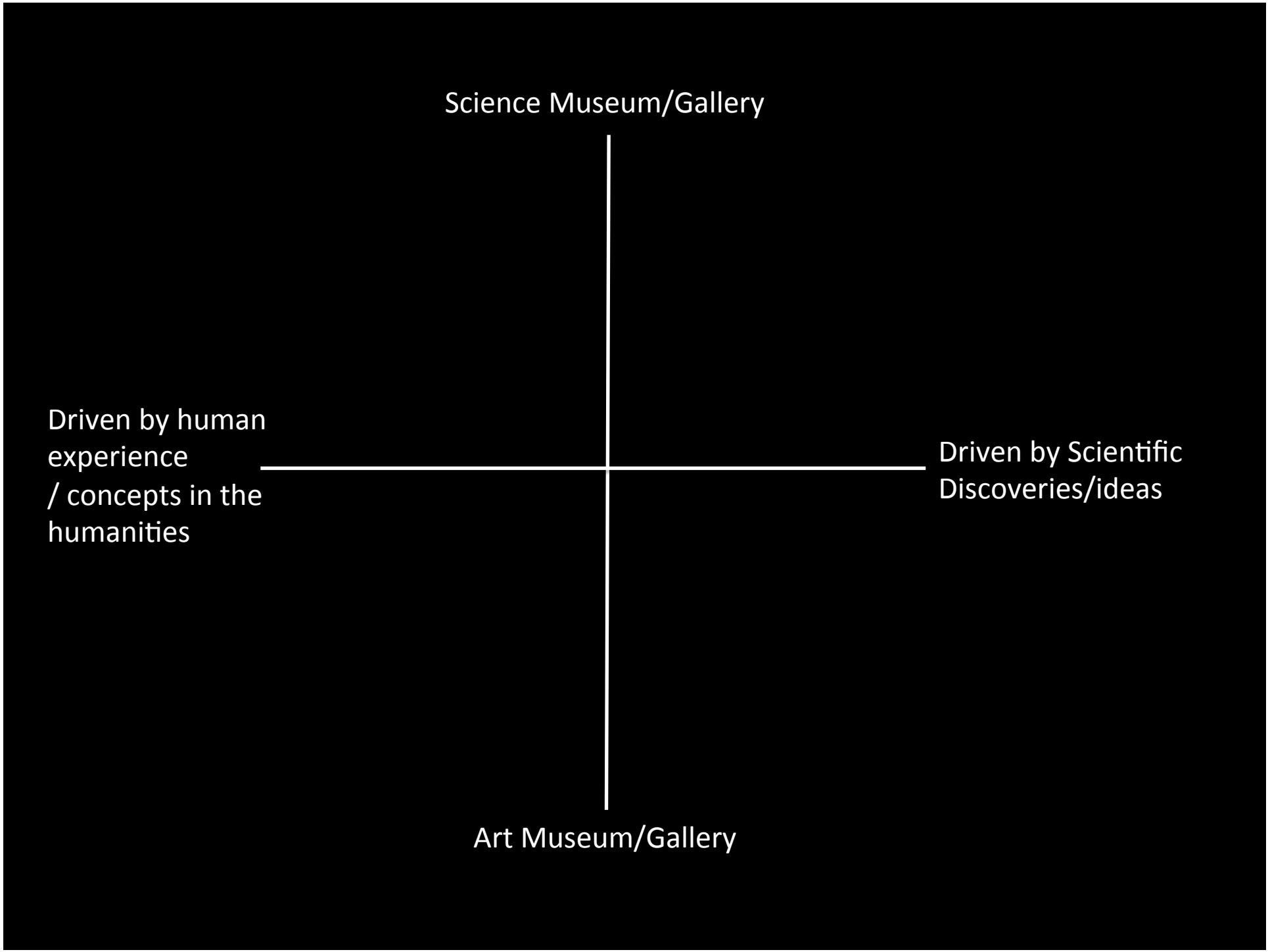


Head Ache – Helen Pynor 2008



My soul in your hands
Katherine Dowson 2007

Blind light
Antony Gormley 2007


Science Museum/Gallery
Driven by human experience / concepts in the humanities
Driven by Scientific Discoveries/ideas
Art Museum/Gallery

Overview

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a

b

c

Image-Question Task

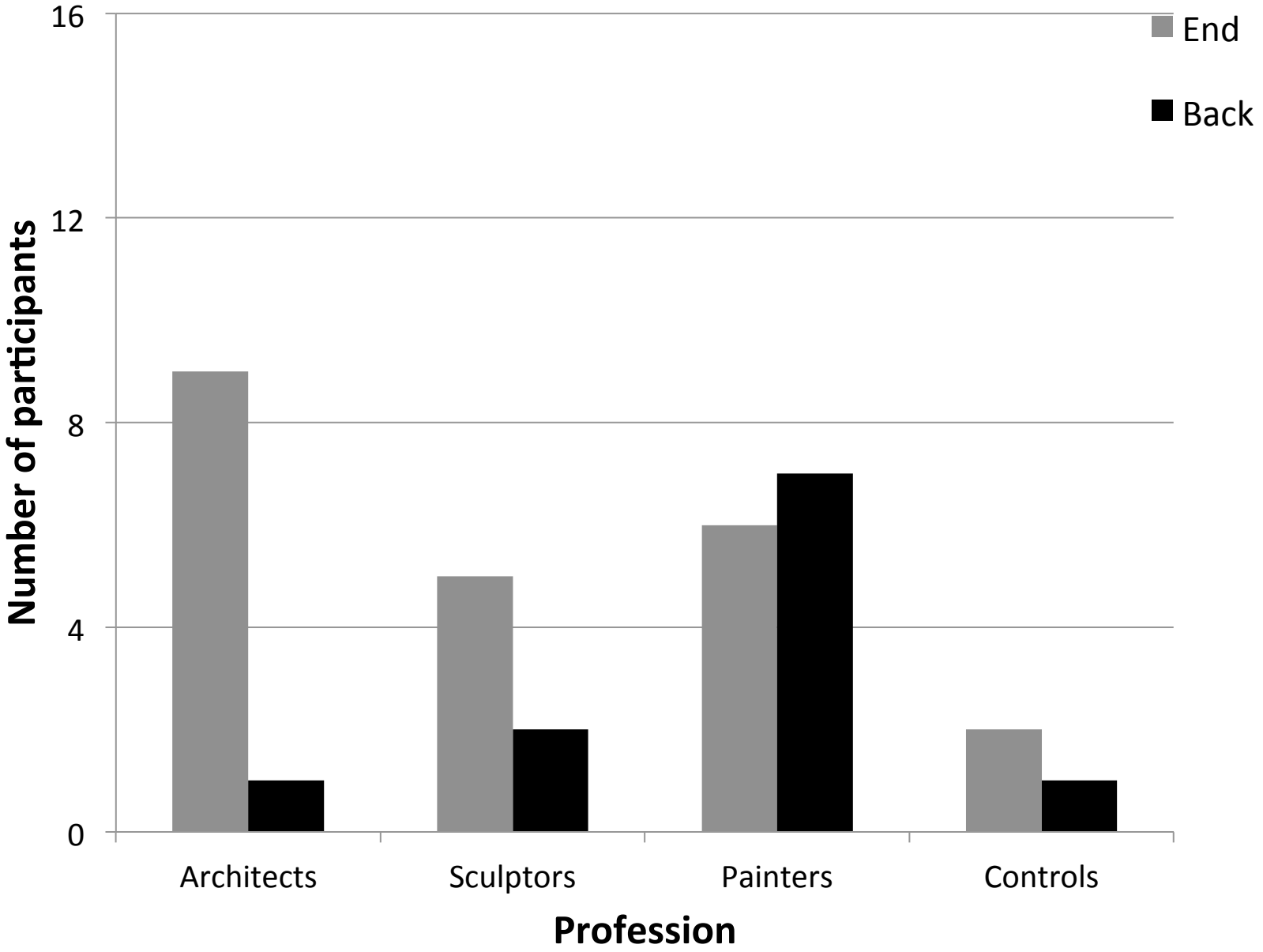
1.Could you please describe the environment that you see in this picture?
2.How would you explore the space in this image, where would you go?
3.If you were given the chance, how would you change the environment in this image?

Final Question

4. A final question, what is space for you?

Cognitive Discourse Analysis

Question-Task	Non-Professionals	Architects	Sculptors	Painters
Could you please describe the environment that you see in this picture? [a]	*… a building façade or interior possibly superimposed on an image of the sea and the ship, and rocks, and it's quite dark, apart from the light in the center.*	*,,a body of water going down between huge cliffs disappearing into some bits …a lot of light towards the end.*	*,,it starts at the top as a mixture of architectural wall and a landscape … a chasm at the end of which it seems there is the setting sun.*	*,,there is a ship in the middle coming through a distorted window, a high arched window with what looked like mountains at the back.*
How would you explore the space in this image, where would you go? [b]	*I just like to explore and see what's there, obviously I can see what's here but behind the arches and behind that pillar…I'd just walk around and see all the hidden statues… and obviously looking up at the ceiling as well… so that's what I would do.*	*I would touch materials around, it's a very,, the cold stone seems inviting to touch. I would want to go to the side-walls and touch them.*	*I always like to get up close to the surfaces of things,, sort of see how the floors are laid and look at the panels on the pillars and then the copper ceilings and see how things were made…*	*I'd probably walk down..towards the crossing…maybe back into the nave here..now just looking at it as a 2dimensional abstract image..my eye goes straight to this on the right…all these lines take my eye down…there's a bit of a yellow colour ..*
If you were given the chance, how would you change the environment in this image? [c]	*I suppose you could have a cycle lane…so that people can cycle along this street…hum,, trees, more trees is always nice..*	*,, to take away that barrier to the river, it be quite nice to be able to walk along the edge and feel you were directly over the water … so having a solid balustrade puts a bit of a barrier between you and the river… breaking about barriers between you and the pavement, and the pavement and the river..*	*there are a lot of objects already there… if I were to make a sculpture somewhere along this area I would remove the telephone box, which is extremely red as an object, a very powerful object.. I would turn the sound on… plenty of sits for people to sit on…*	*I would want to straighten up the diagonal of the road and make it more flat to the bottom edge, flatten it down, I'd want to bring it down… less of an angle…*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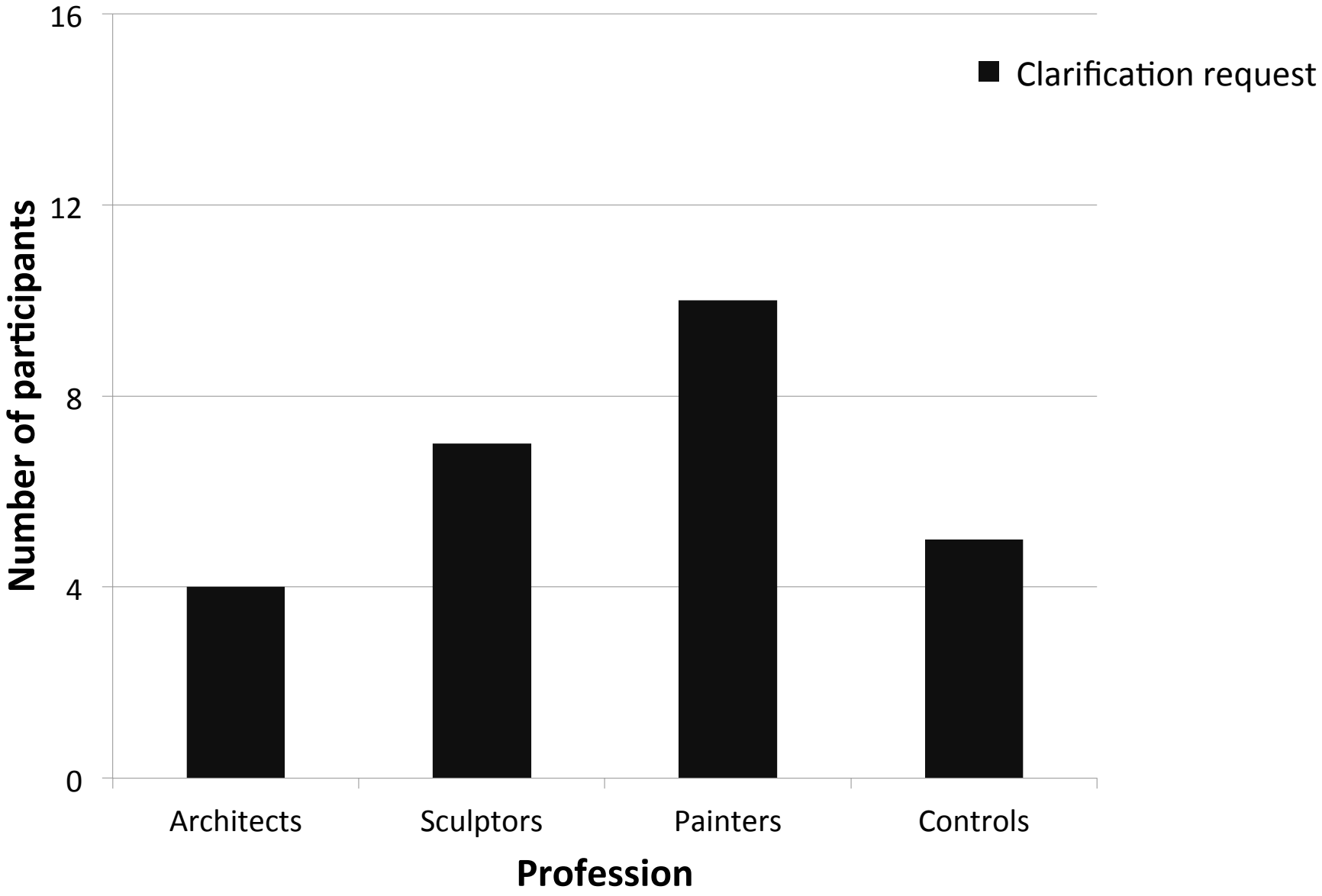
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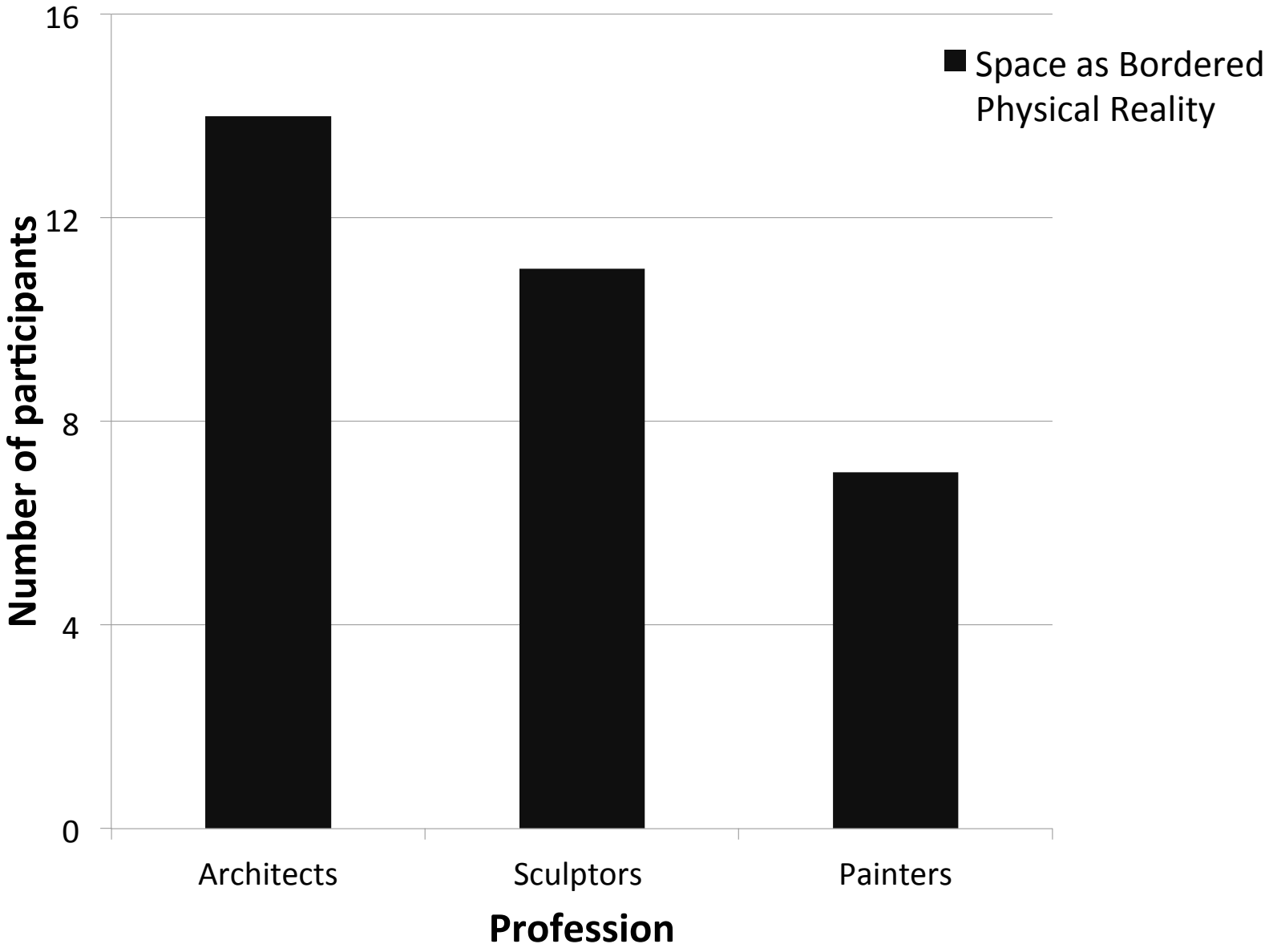
Controls
Profession


16
12
8
4
0
Number of participants
Space as Bordered Physical Reality
Architects
Sculptors
Painters
Profession

Conclusions

- Certain words/phrases can be used to distinguish between the spatial practioners and non-practioners (e.g. ‘the end’)
- Painters switch between a 3D movement through the space and a 2D or layered approach to considering the space depicted
- Architects focus less on the 2D properties and more on the materiality of the content
- Sculptors are generally similar to architects but present a pattern half-way between architects and sculptors

Summing Up

- Neuroscientists should engage researchers in the visual arts
- The arts gain from a broader range of ideas to explore
- Scientists gain from the broadening of experience

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