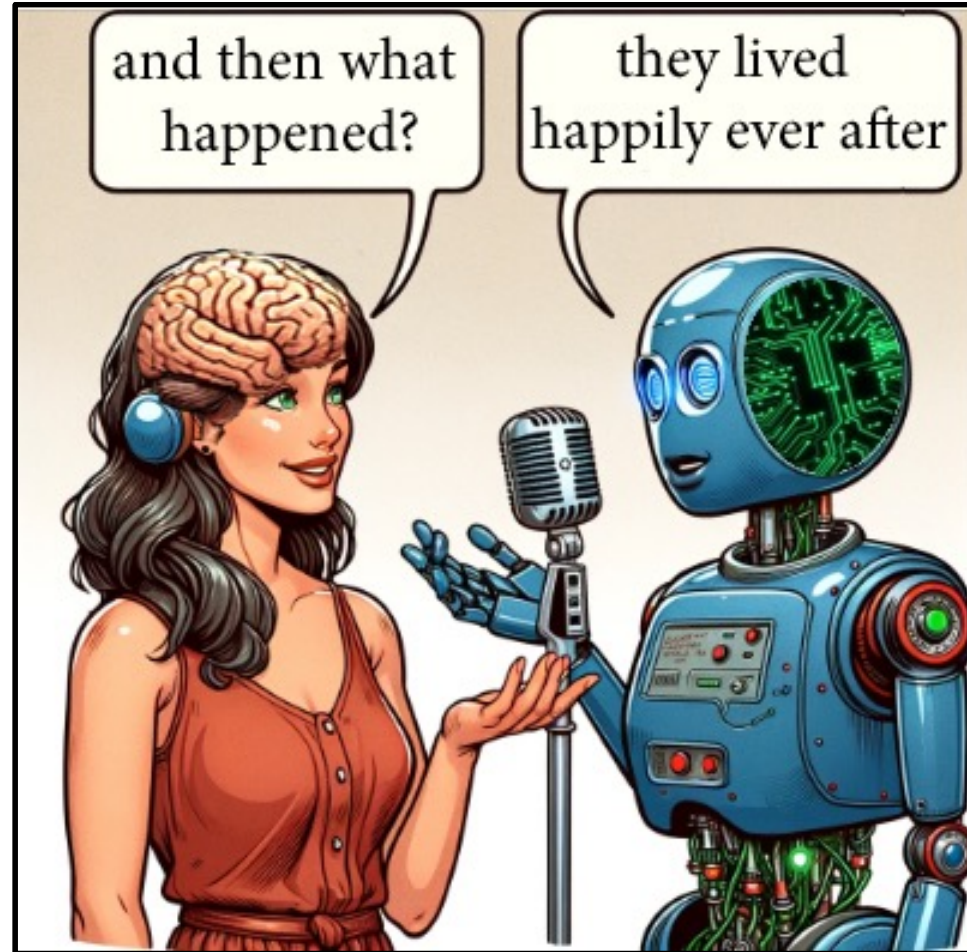
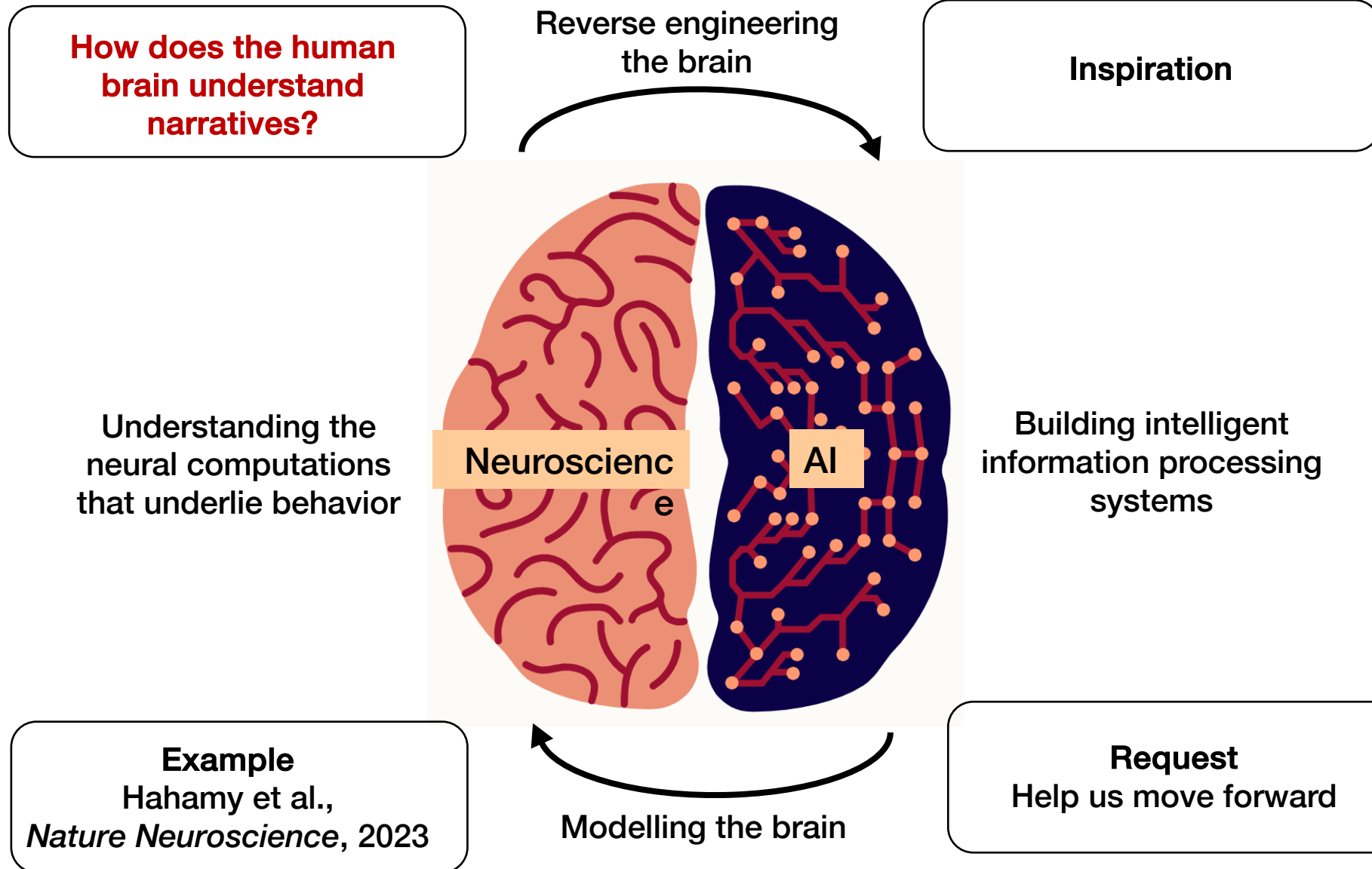


# Disclaimer: the presenter is a neuroscientist



Avital Hahamy, University College London

# Interchange between human and Artificial Intelligence

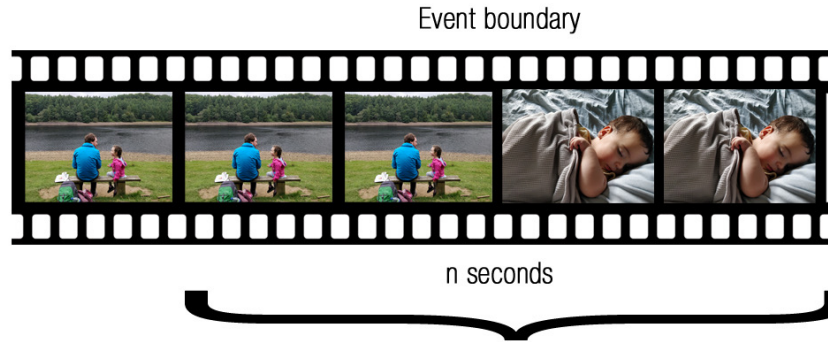




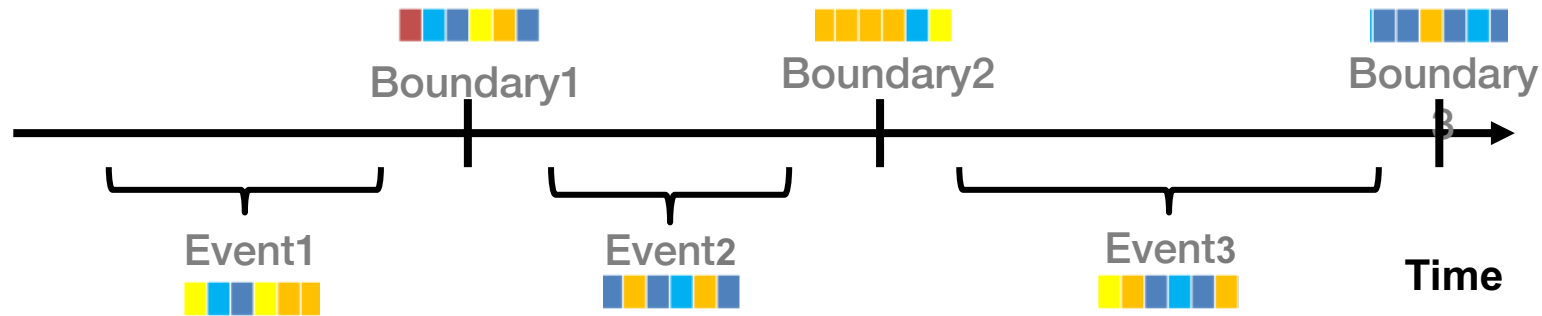
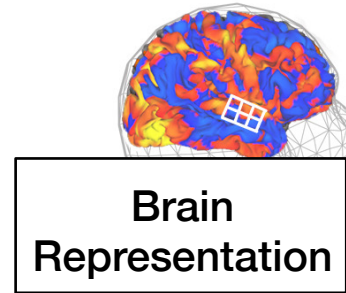
# Methodology: studying fMRI brain representations



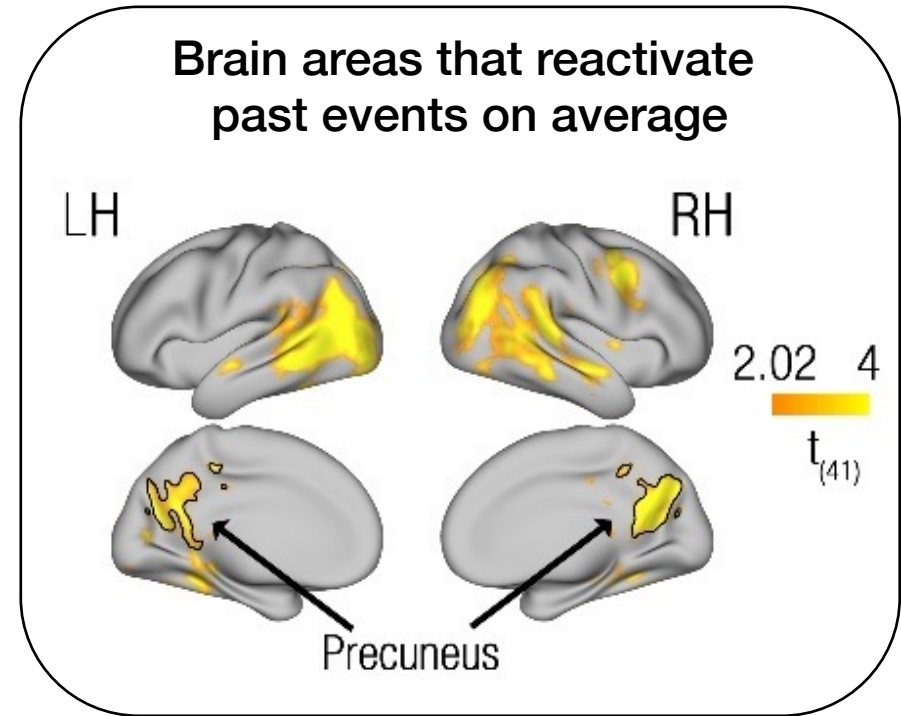
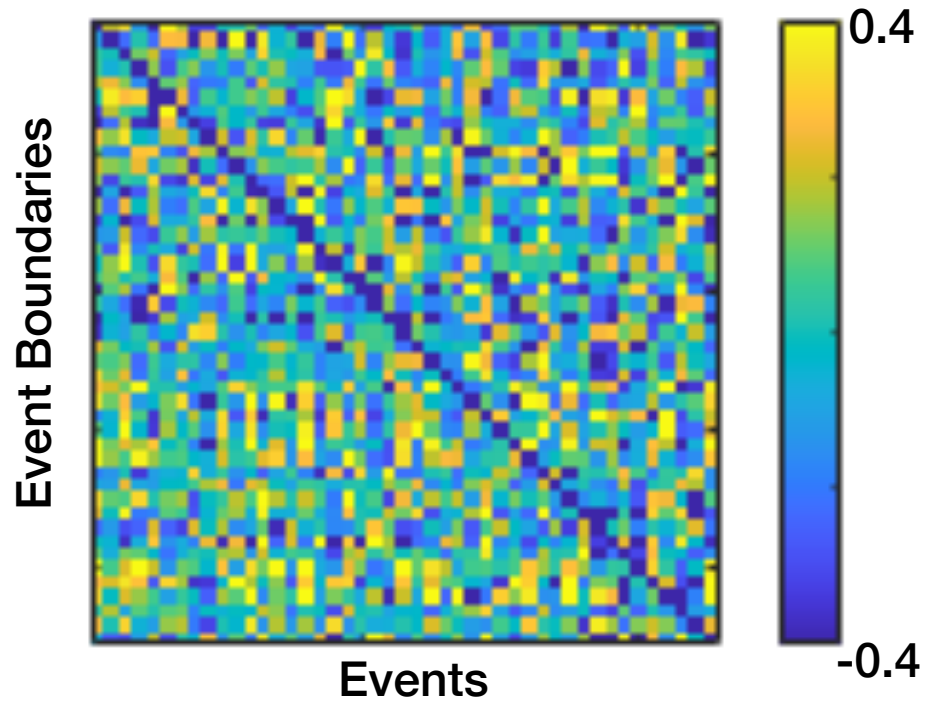
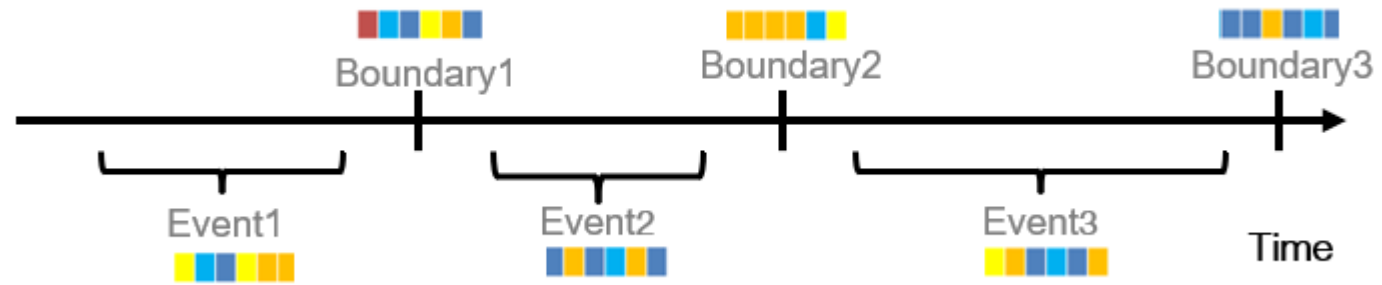
Dataset 1



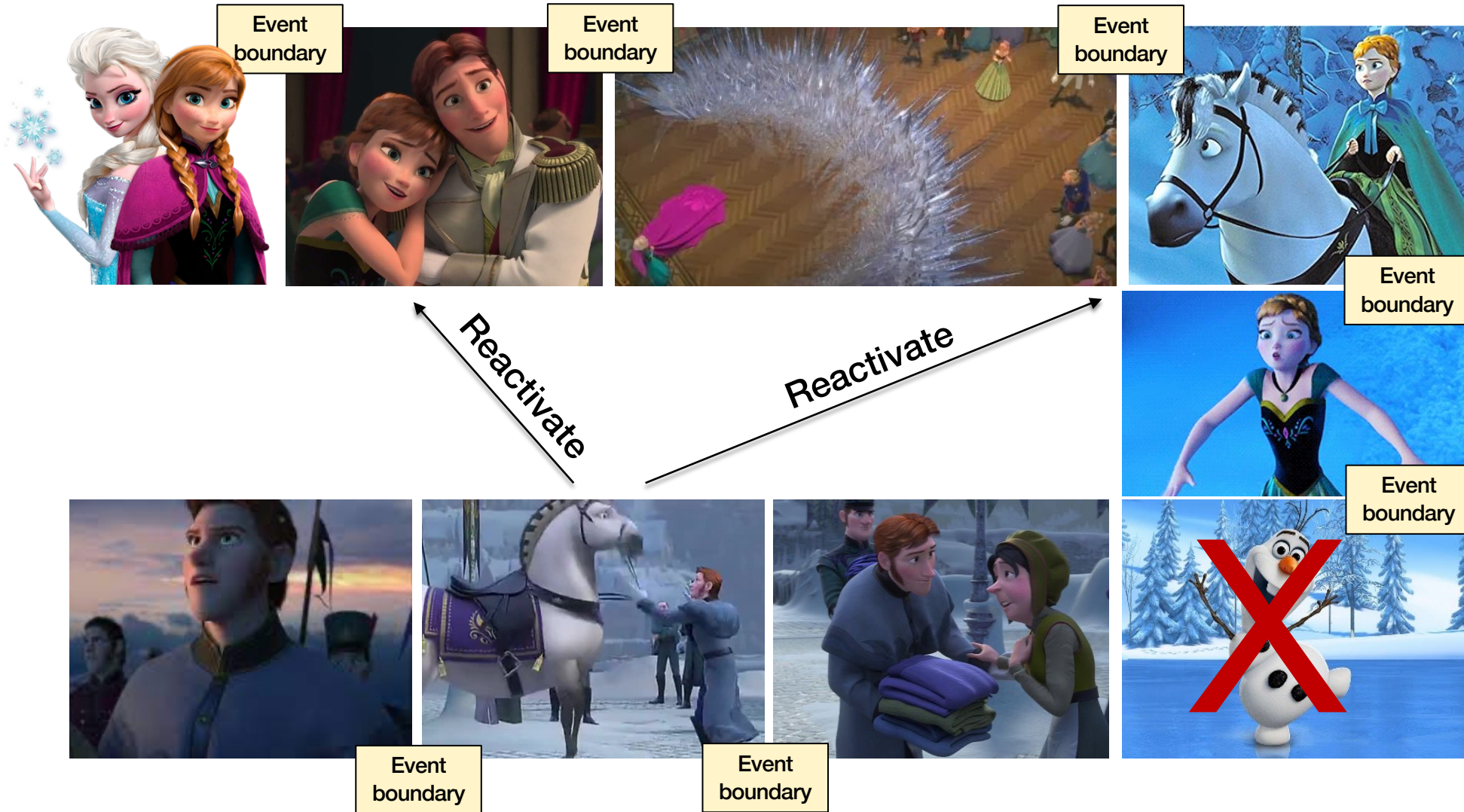
Dataset 2



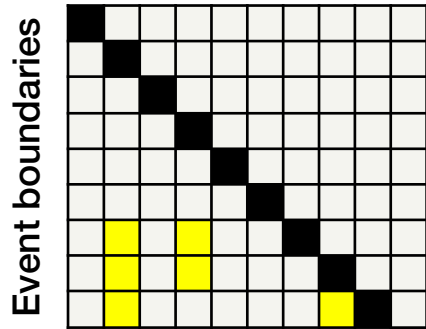
# fMRI reactivation of remote events



# Is the reactivation context-specific?



Brain reactivation



Event boundaries

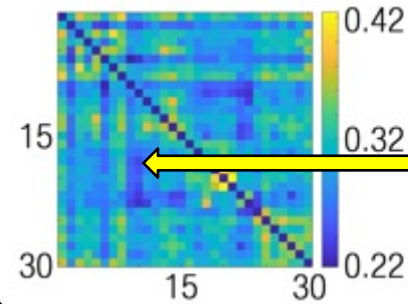
Events

# Modelling context-specific reactivation

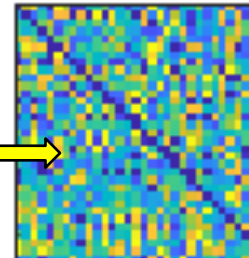
Scene Segments	Scene Details - A Level
27 2. War Scene	Gunfire by a soldier along a wall made of stacked stones
28	A bomb or land mine goes off in the middle of a grassy field
28	A Soldier kicks open a door. Soldiers shooting at a target
29	Close up view of John tossing in bed while sleeping
30	More gunfire. Two soldiers seen hand signalling to each other in the battlefield
31	Sideways view of John sleeping at night
31	One of the soldiers that was signalling collapses
32	A soldier runs across the battlefield. Cut to another soldier standing and aiming
32	Quick shot of John's face in pain as he is lying down on the battlefield and screaming
33	Random gunfire by a soldier standing nearby and a full body view of John lying down
35	First person view of a soldier running in battle with fellow soldiers. Someone yells
36 3. Watson Wake-Up	John's eyes open at the sound of an echoing voice.
37	John immediately gets up from his bed.
39	John is panting and his breathing is rough from his nightmares.
43	John is slowly calming down, his breathing is getting slower.
55	John lies back down and continues to calm his breathing. He begins to weep
64 4. Watson Morning	John sits upright on his bed contemplatively in the middle of the night with his eyes closed



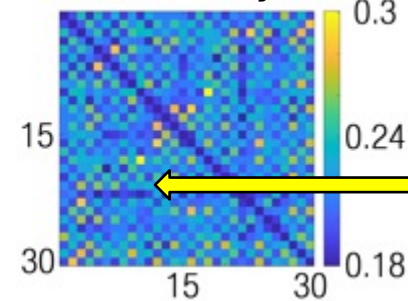
scene similarity matrix



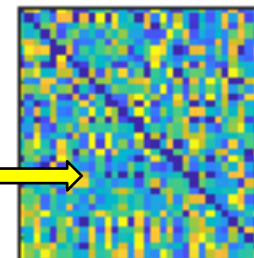
Brain reactivation



scene-similarity matrix



Brain reactivation



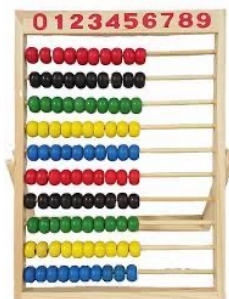
>Sentence BERT/LDA

(a) A storyline

This is Los Angeles. And it's the height of summer. In a small bungalow off of La Cienega, Clara serves homemade chili and chips ....

B storyline

At 74th and Columbus, Apartment 9D, Steven Perdue watches his wife get ready for her violin lesson: black clothes, pearl necklace, her controlled, quiet elegance....

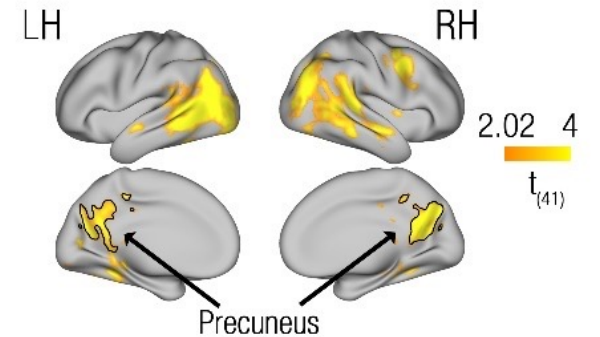


Bag of words scene representation

What	1	0	0	0	0	0
is	0	1	0	0	0	0
the	0	0	0	1	0	0
?	0	0	0	0	0	1
behind	0	0	1	0	0	0
left	0	0	0	0	0	0
chair	0	0	0	0	0	0
table	0	0	0	1	0	0

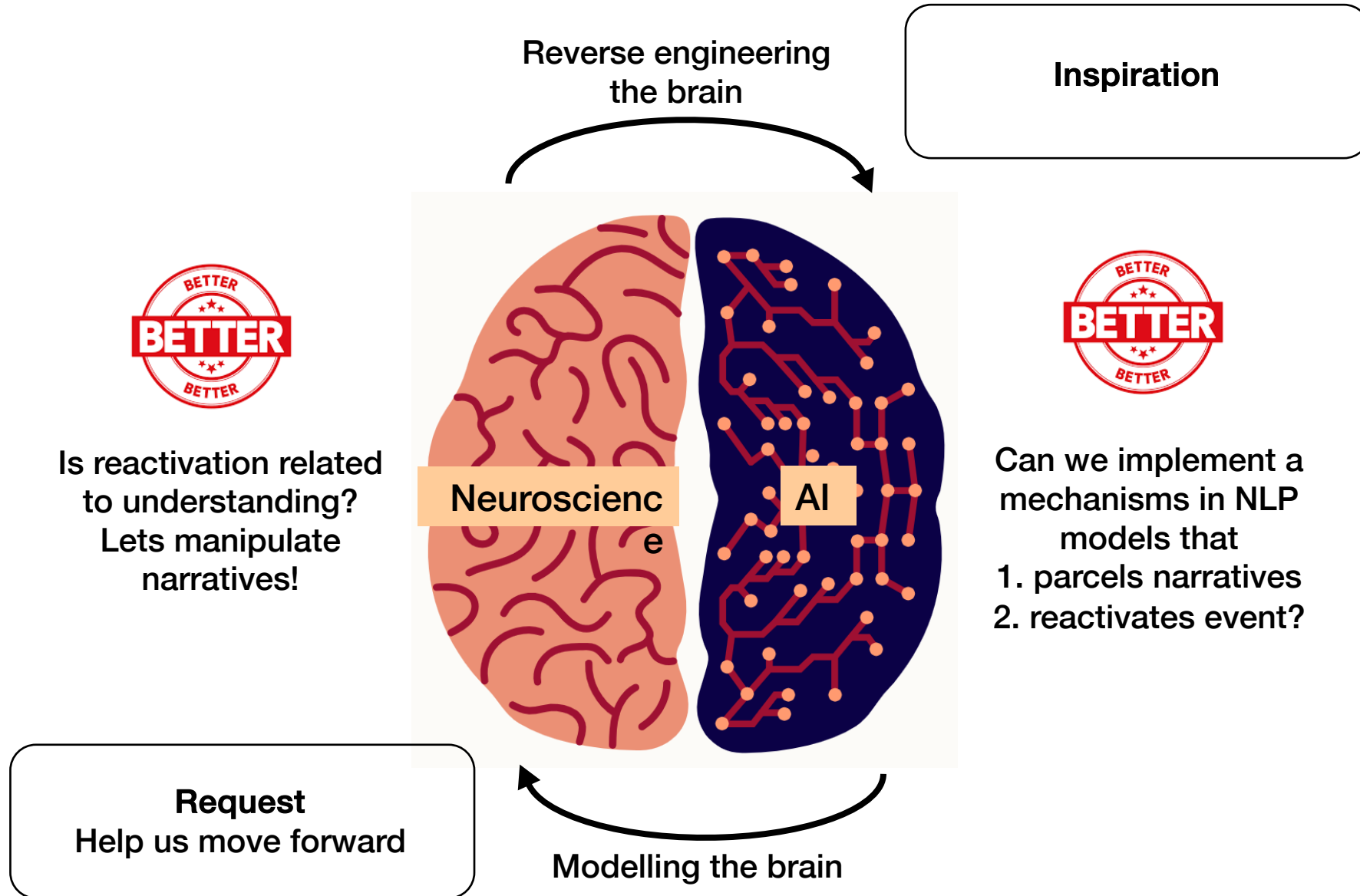
$V_{eqt}$

Brain areas that reactivate past events



Reactivation of contextually-relevant events at event boundaries

# An interchange between human and artificial intelligence



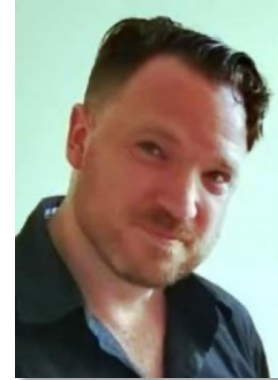




# Thanks for listening!



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Haim Dubossarsky  
Queen Mary University of London

