

Hierarchical Temporal Memory

A Theoretical Framework for the Neocortex

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LessWrong Community Weekend 2019

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The Human Brain in Numbers

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The Human Brain in Numbers

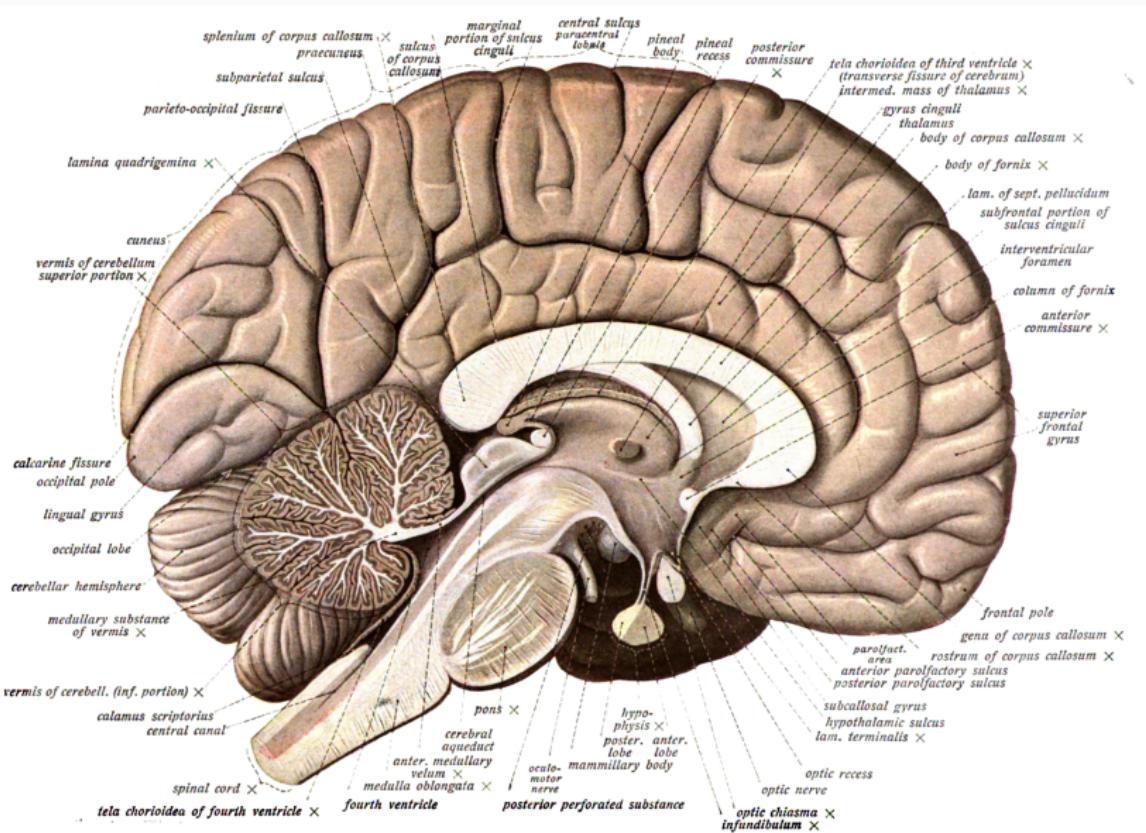
Neurons in brain (total)	86 billion (100%)
Neurons in cerebellum	69 billion (80%)
Rel. size of cerebellum	10% of brain mass
Neurons in cerebral cortex	16 billion (19%)
Rel. size of cerebral cortex	82% of brain mass

The Human Brain in Numbers

Neurons in brain (total)	86 billion (100%)
Neurons in cerebellum	69 billion (80%)
Rel. size of cerebellum	10% of brain mass
Neurons in cerebral cortex	16 billion (19%)
Rel. size of cerebral cortex	82% of brain mass
Neurons in brain stem	1 billion (1%)

Data taken from [1].

The Human Brain



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Why Hierarchies?

Why Hierarchies?

If there is a connection cost, Hierarchies are more efficient [2].

What Hierarchies

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Attributes of the Brain

Attributes of the Brain

- Invariant

Attributes of the Brain

- Invariant
- Auto-associative

Attributes of the Brain

- Invariant
- Auto-associative
- Massively Parallel

Bit Arrays

Bit Arrays

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Sources i

The slides are online: <https://github.com/fkarg/things-to-talk-about/blob/master/htm/main.pdf>

Drop me a mail: fkarg10@gmail.com

Sources ii

-  S. Herculano-Houzel, "The human brain in numbers: a linearly scaled-up primate brain," *Frontiers in human neuroscience*, vol. 3, p. 31, 2009.
-  H. Mengistu, J. Huizinga, J.-B. Mouret, and J. Clune, "The evolutionary origins of hierarchy," *PLoS computational biology*, vol. 12, no. 6, p. e1004829, 2016.

End

Additional slide

without numbering, does not show up in normal numbers