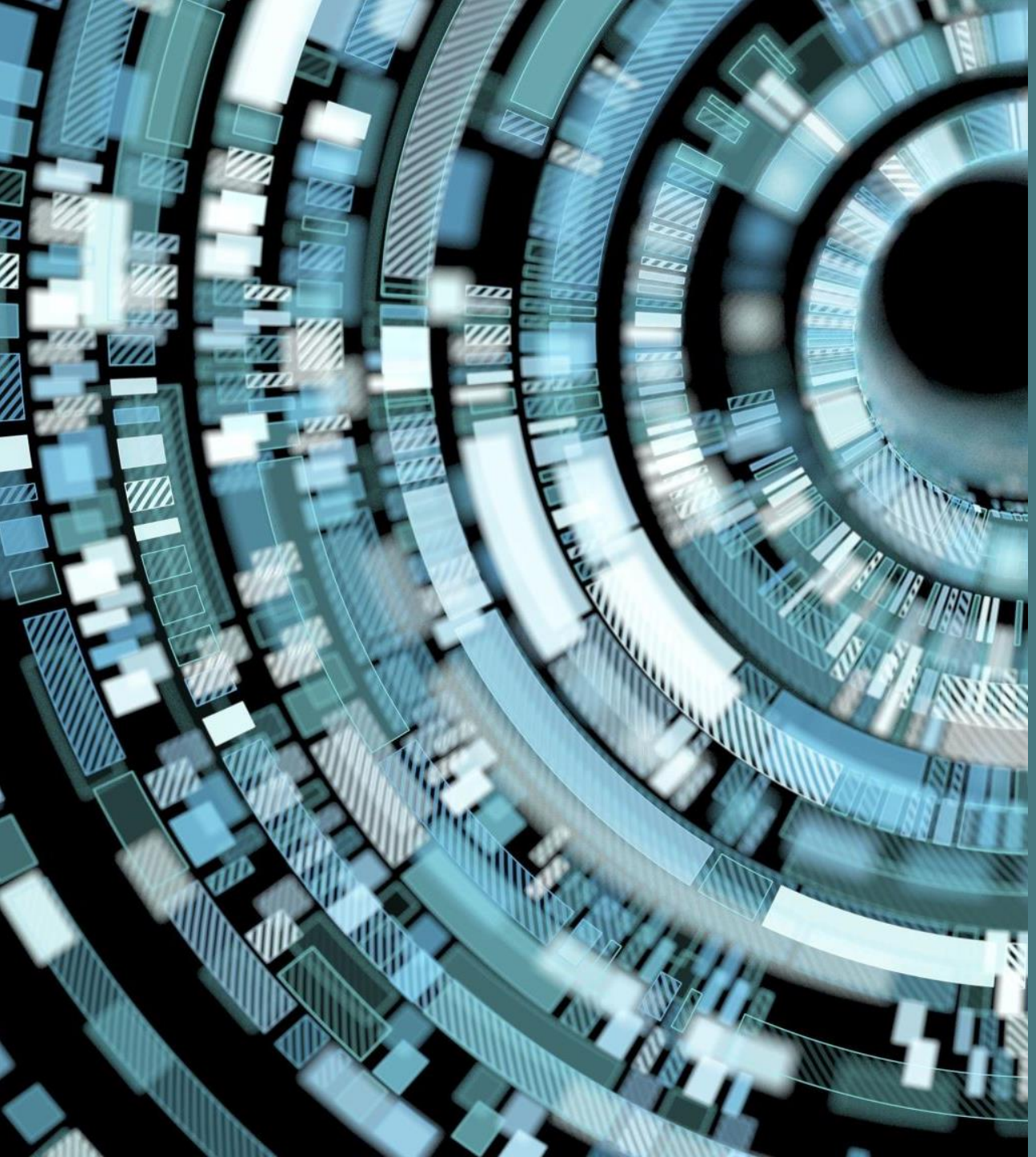

COGNITIVE PROXIES AND THEIR RELATIONSHIP TO HUMAN CONSCIOUSNESS IN THE CONTEXT OF AI RESEARCH (QUALIA)

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INTRODUCTION

- Integration of evidence from multiple specialized fields of inquiry and multiple physiological systems have yielded robust evidence for the key mechanisms that generate and maintain human consciousness/mind.
- This evidence is being translated into the wellness and clinical settings to ameliorate human suffering due to disorders of human consciousness/mind. It is also being translated into AI algorithms.

DEFINITION

- Consciousness. https://en.wikipedia.org/wiki/Consciousness
  - Permits autonomy (agency)
  - Integrated awareness of and response to self
  - Integrated awareness of and response to environment
  - Living (molecularly programmed and executed change over time with respect to internal and external object environments).

LIMITATIONS OF CONSCIOUSNESS

Information Acquisition

- Temporal resolution
- Spatial resolution

Information Integration

- Over time
- Over space

The Proxy/Qualia Issue

- Can we reverse engineer the mechanisms of human consciousness using proxies/qualia

CAPACITIES

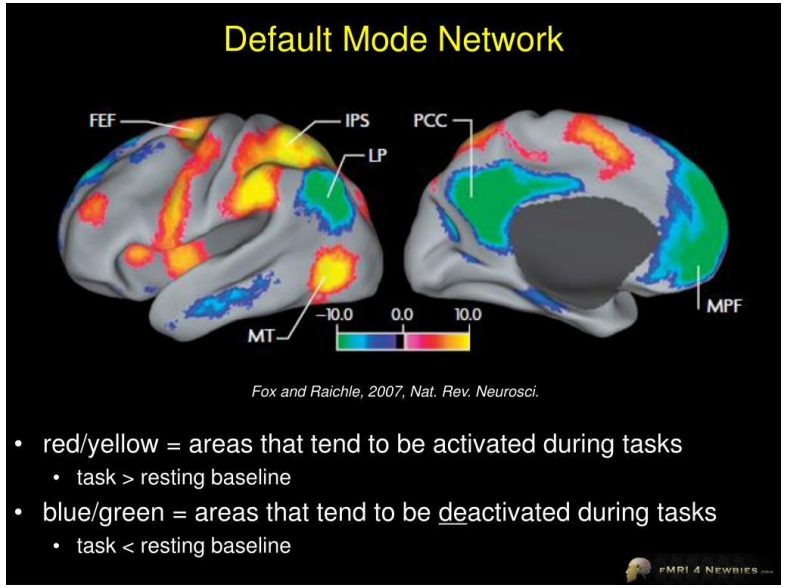
- Independent acquisition of substances/molecules needed to continue shaping self and local processes by individual actions.
- Alter molecular pathways among nervous, endocrine, and immune cells to permit surviving, homeostasis, and growth.
- Alter objects in the external environment to permit surviving, homeostasis, and growth.

PHYSIOLOGICAL EVIDENCE

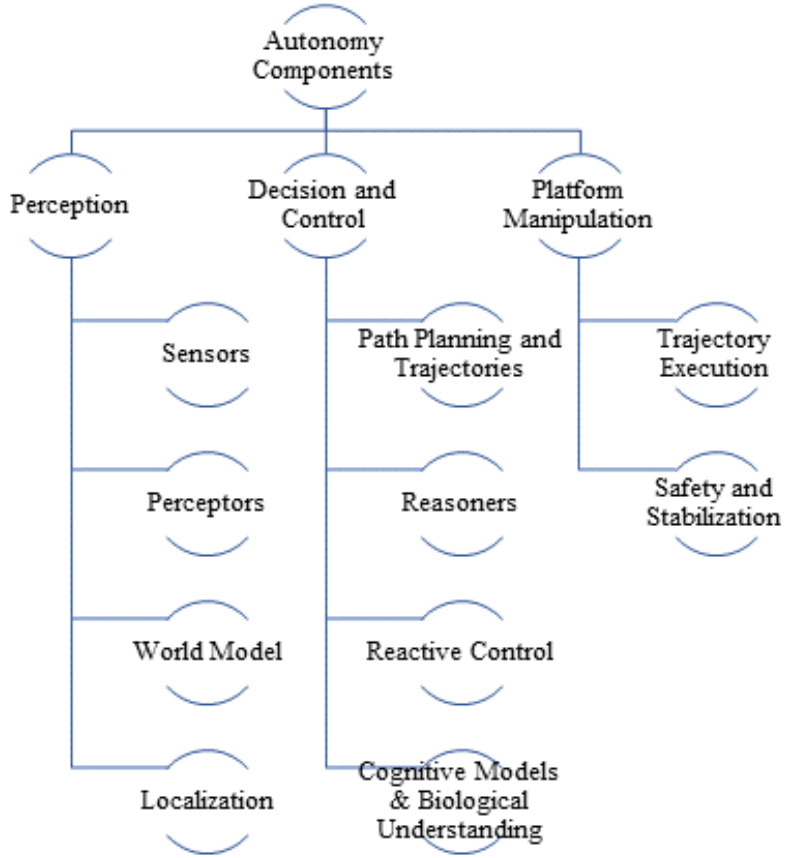
- Lesion studies
- Imaging studies
- Molecular (includes genetics and epigenetics)
  - Cells make, use, deconstruct, and discard molecular structures necessary to maintain the cell's life.
- Behavioral

COGNITIVE EXOSKELETON

- Neuron networks[1]
- AI algorithms[2]



https://www.slideserve.com/webb/basics-of-experimental-design-for-fmri-block-designs



1. Molnar-Szakacs, I. & Uddin, L.Q. (2013) Self-processing and the default mode network: interactions with the mirror neuron system. Frontiers in Human Neuroscience, doi:10.3389/fnhum.2013.00571.
2. Bihl, T., Jenkins, T., Cox, C., DeMange, A., Hill, K. & Zelnio, E. (2019). From lab to internship and back again: learning autonomous systems through creating a research and development ecosystem. The Ninth AAAI Symposium on Educational Advances in Artificial Intelligence (EAAI-19).

SENSOR MODULES: AI AND HUMAN

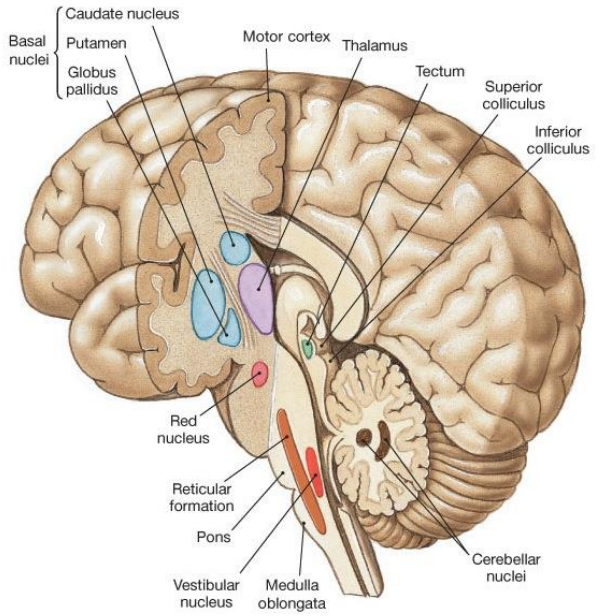
- Internal
- External

FEEDBACK LOOPS BETWEEN MODULES

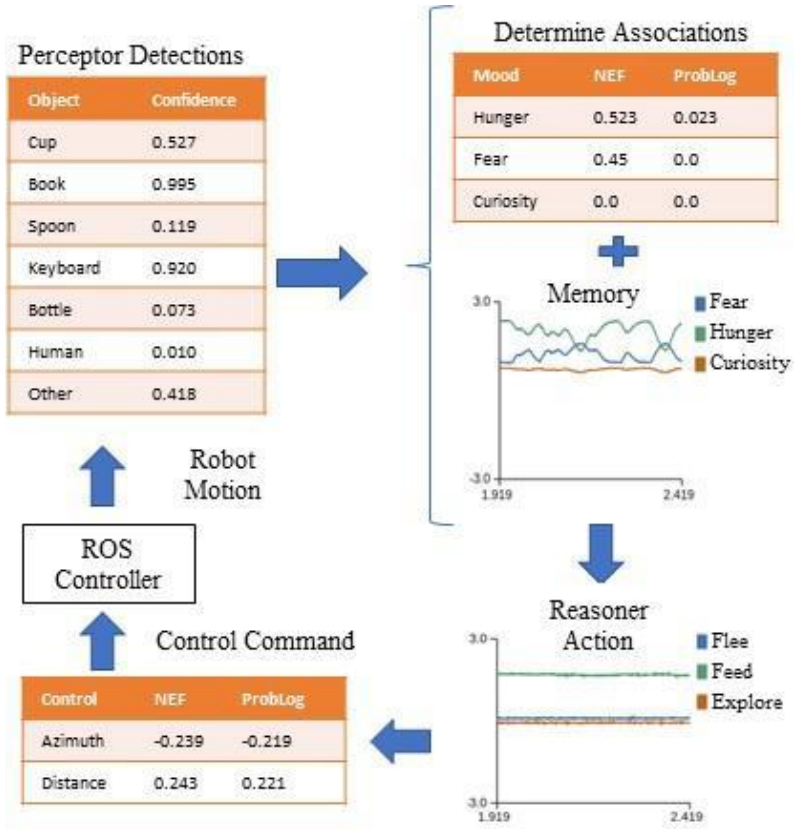
Human Basal Ganglia

Recurrent Loop Interacting Networks

AI Basal Ganglia[1]



http://www.csloh.com/research/expertise-skill-acquisition/procedural-memory/



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SCOTOMAS CREATE INTERRUPTED CONSCIOUSNESS

- Vision
- Perception
  - Attentional Blink
- Reasoning

MODULAR UNITS/DISTRIBUTED PROCESSING IN THE CONTEXT OF CONSCIOUSNESS

- Broca
  - Motor production of speech (unconscious)
- Wernicke
  - What does a word or string of words mean (conscious)

PROXIES AS NEURON MODULE OUTPUT

- Colors
- Words
- Motor behaviors

https://teresadlonghawkes.medium.com/the-proxy-life-59773736ad45

MIRROR MODULES ARE KEY TO MAMMALIAN CONSCIOUSNESS FUNCTION

- Self-identity
- Other-identity is modeled in self-identity module

Question: if the self-identity of a living creature cannot be sufficiently modeled in the other's self-identity, can that first creature be understood or reacted to efficaciously by the second creature?

Hawkes, T.D., Bihl, T.J. and Rogers, S.K. (2016). Qualia exploitation of sensor technology (QuEST) for V2V hacking protection. 2016 IEEE Vehicular Networking Conference (VNC), Columbus, OH, December 8-10. 2016. Distribution A. Approved for public release; distribution unlimited. Case No 88ABW-2016-4815.

Molnar-Szakacs, I. & Uddin, L.Q. (2013) Self-processing and the default mode network: interactions with the mirror neuron system. Frontiers in Human Neuroscience, doi:10.3389/fnhum.2013.00571

ARE PROXIES QUEST QUALIA?

- I will invite the AI experts to sound forth on what Qualia are in the QuEST context.

QUALIA AND AI INTELLIGENCE AMPLIFICATION MACHINES

- Why do human minds need intelligence amplification machines with hardware and software structures based in Proxies/Qualia?