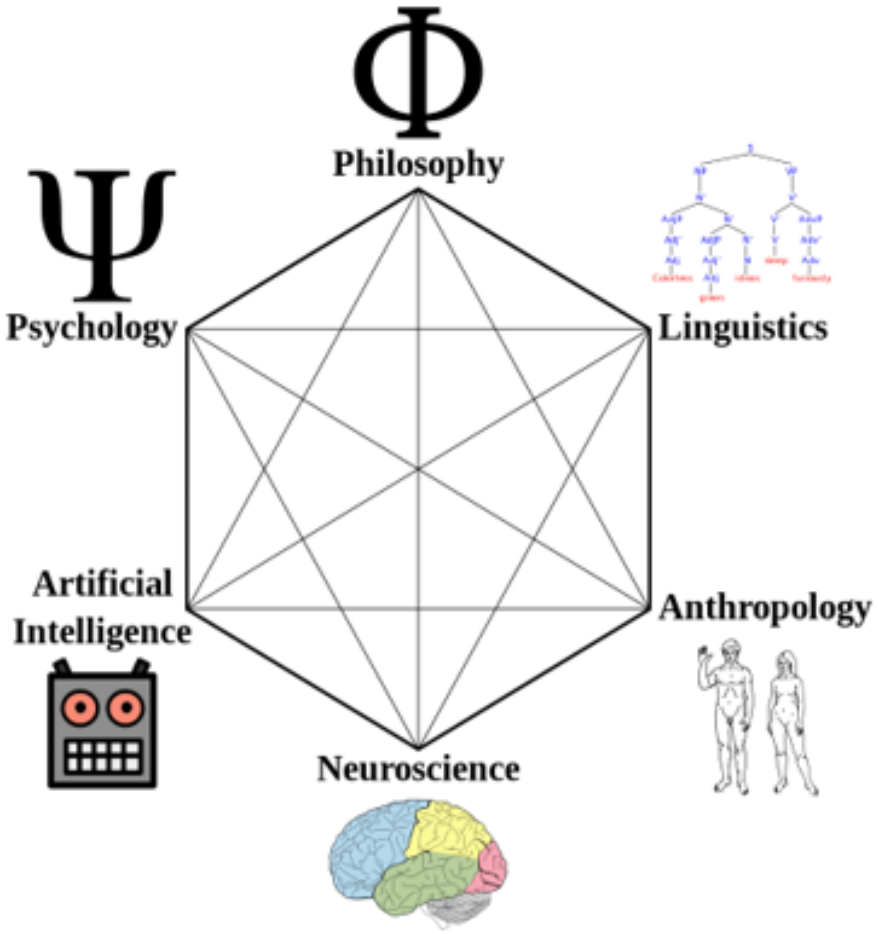
THE UNIVERSITY of EDINBURGH

Cognitive Science MSc

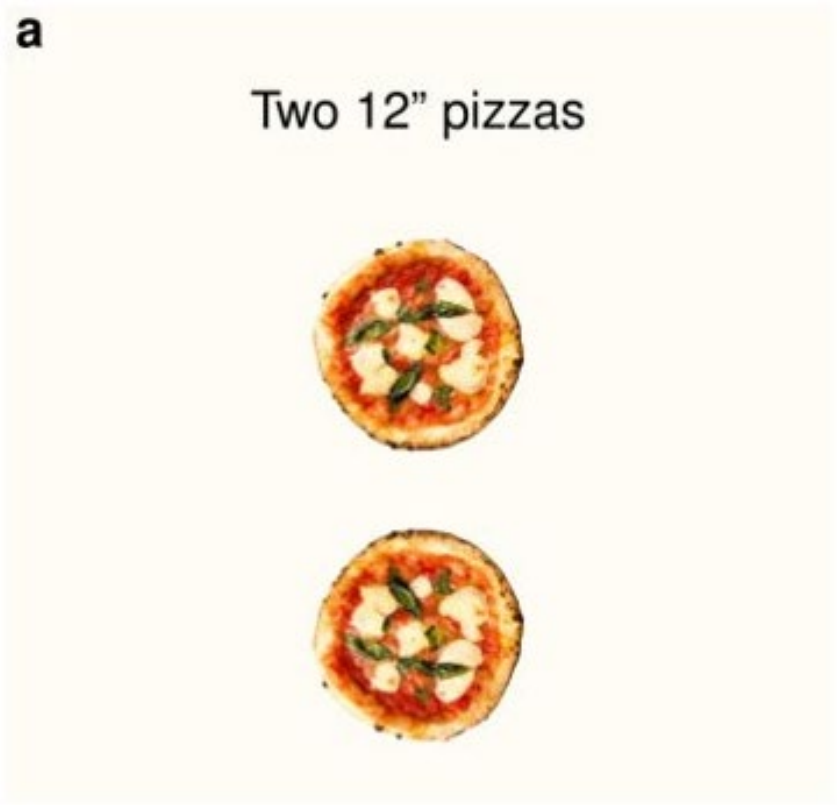
Prof. Frank Keller
Programme Director

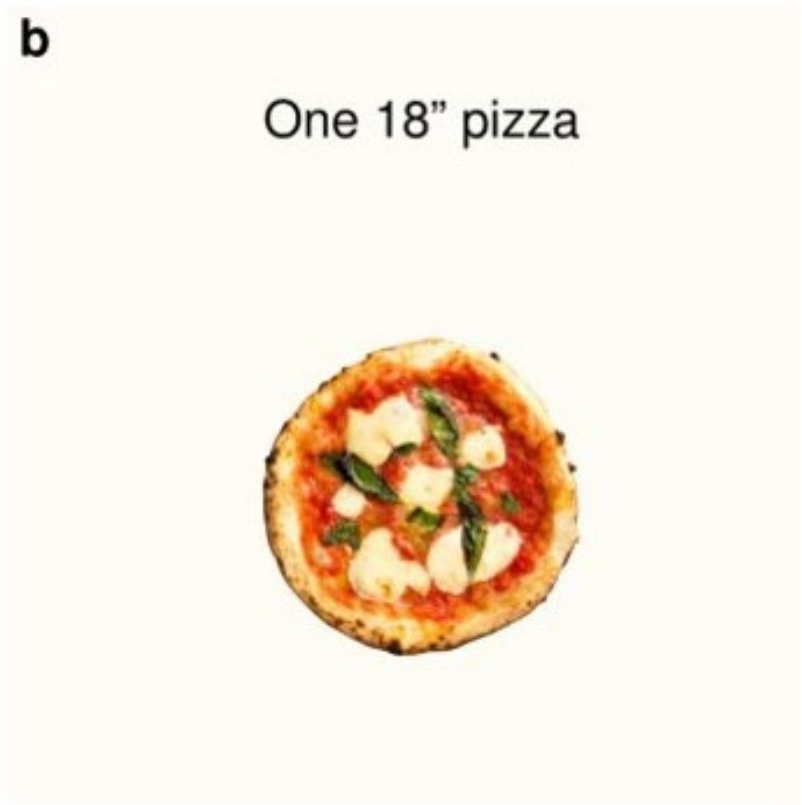
EDINBURGH
Extraordinary futures await

What is cognitive science?



Which is more pizza?





Which is more pizza?

a

Two 12” pizzas

$$\text{Area} = 2 \times \pi 6^2 = 226\ \text{in}^2$$

b

One 18” pizza

$$\text{Area} = \pi 9^2 = 254\ \text{in}^2$$

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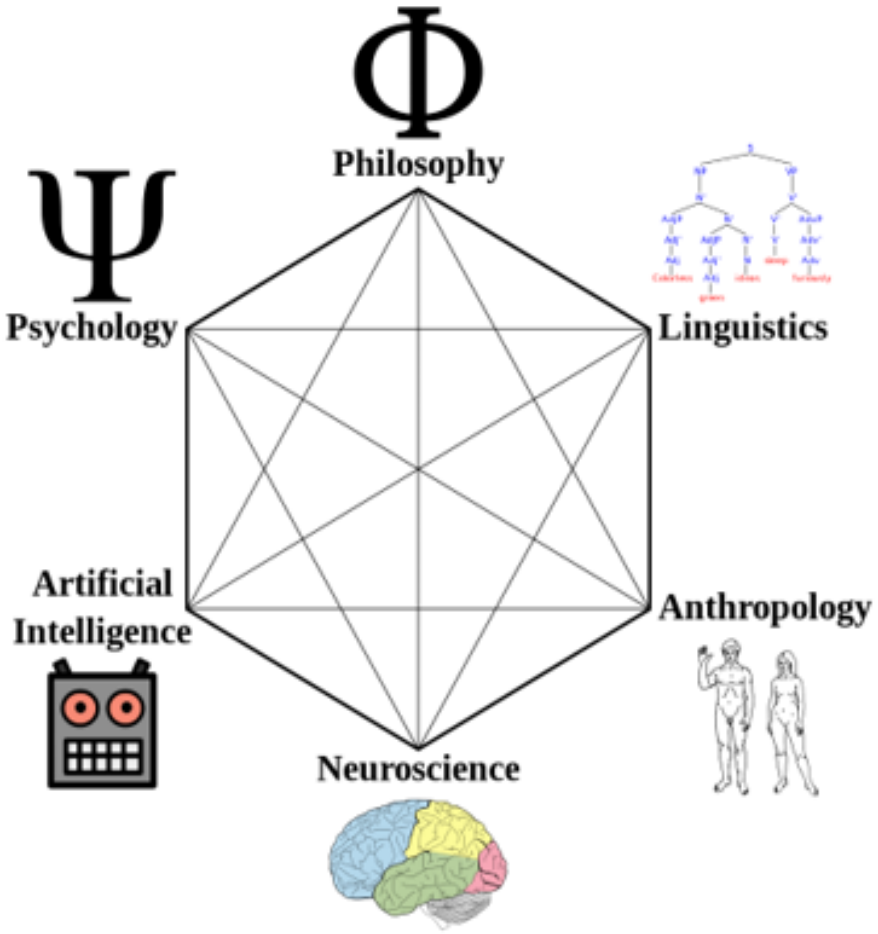
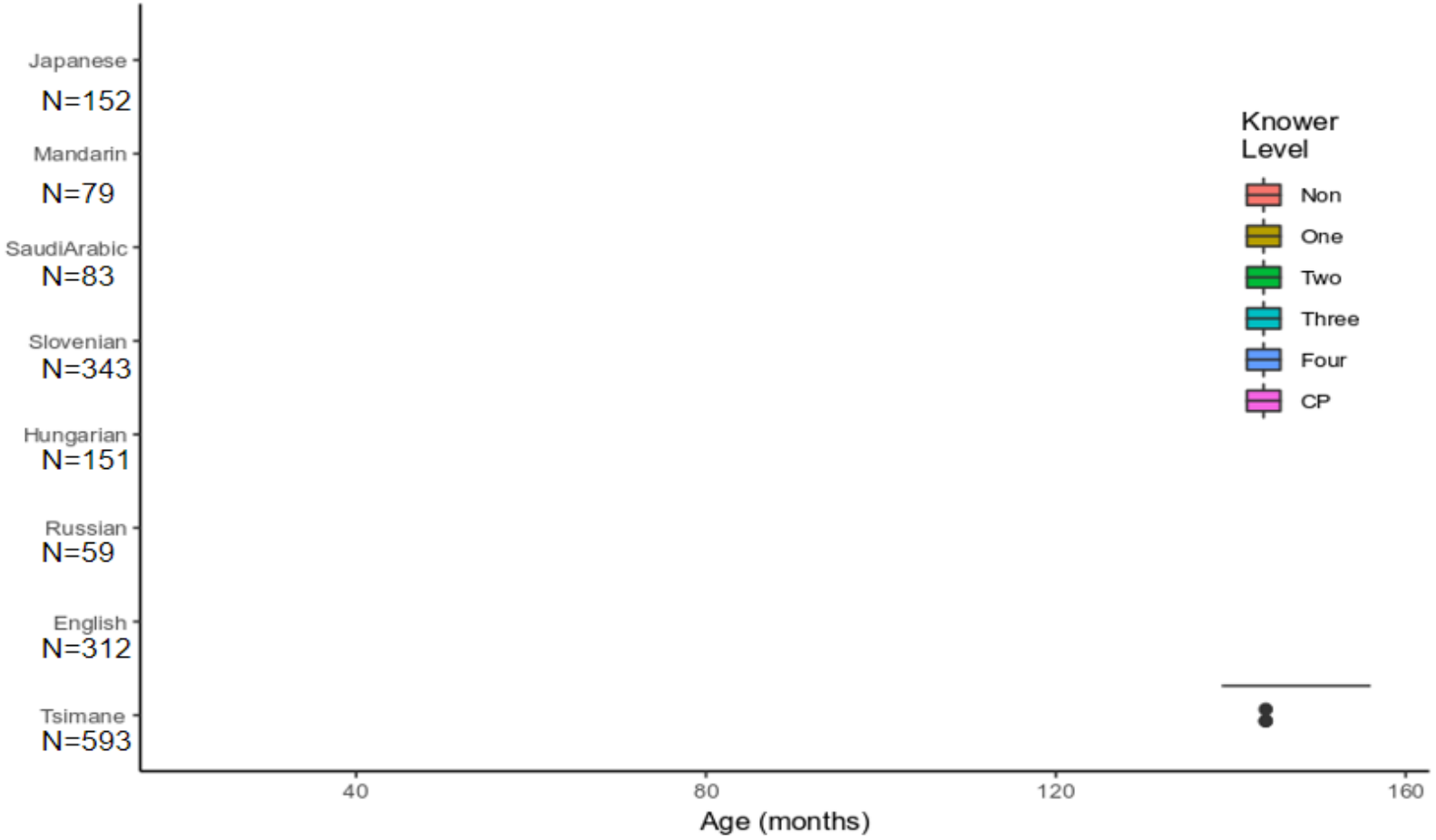


Psychology

Psychology

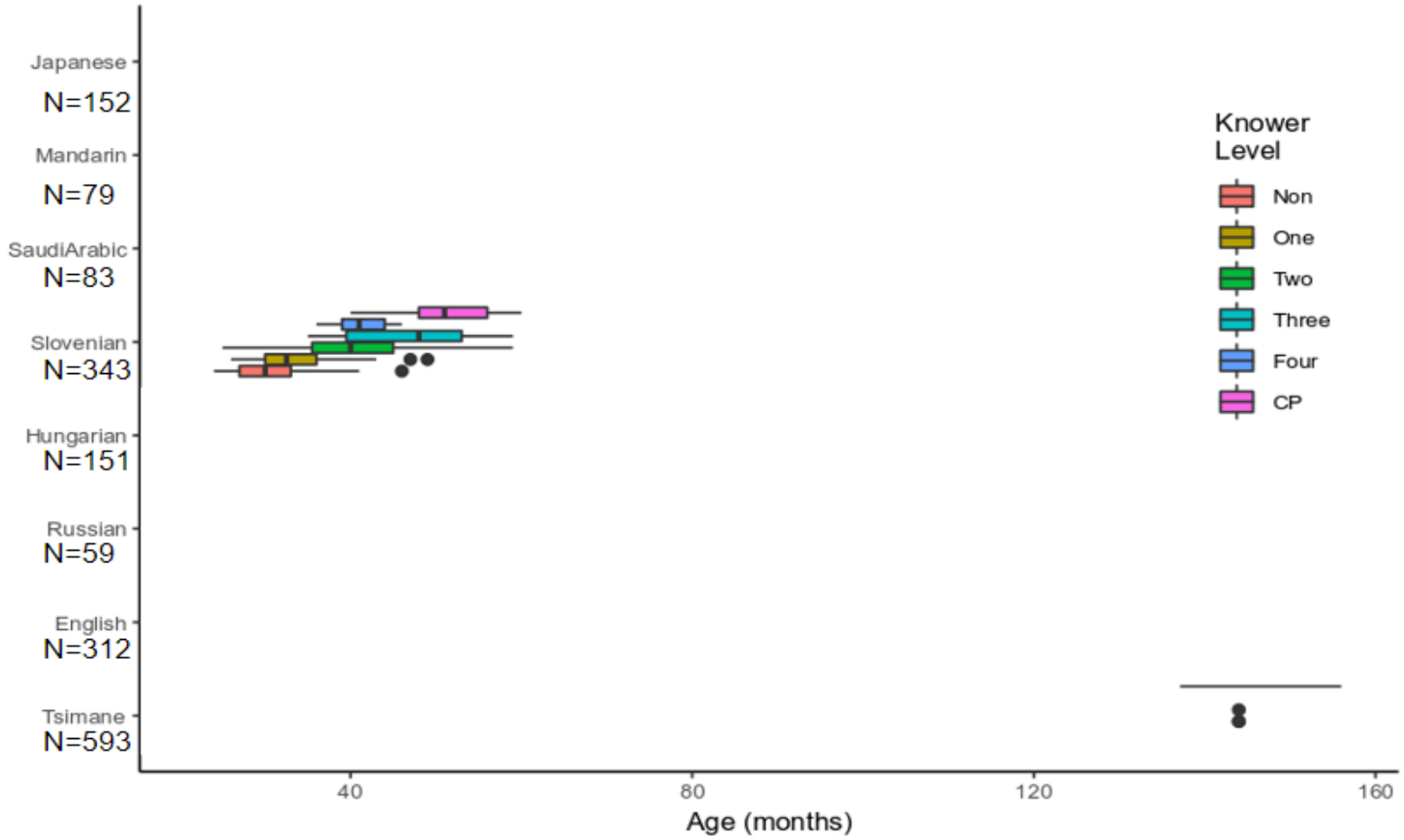
Psychology

Psychology



Piantadosi et al., 2014, Developmental Science.

Psychology



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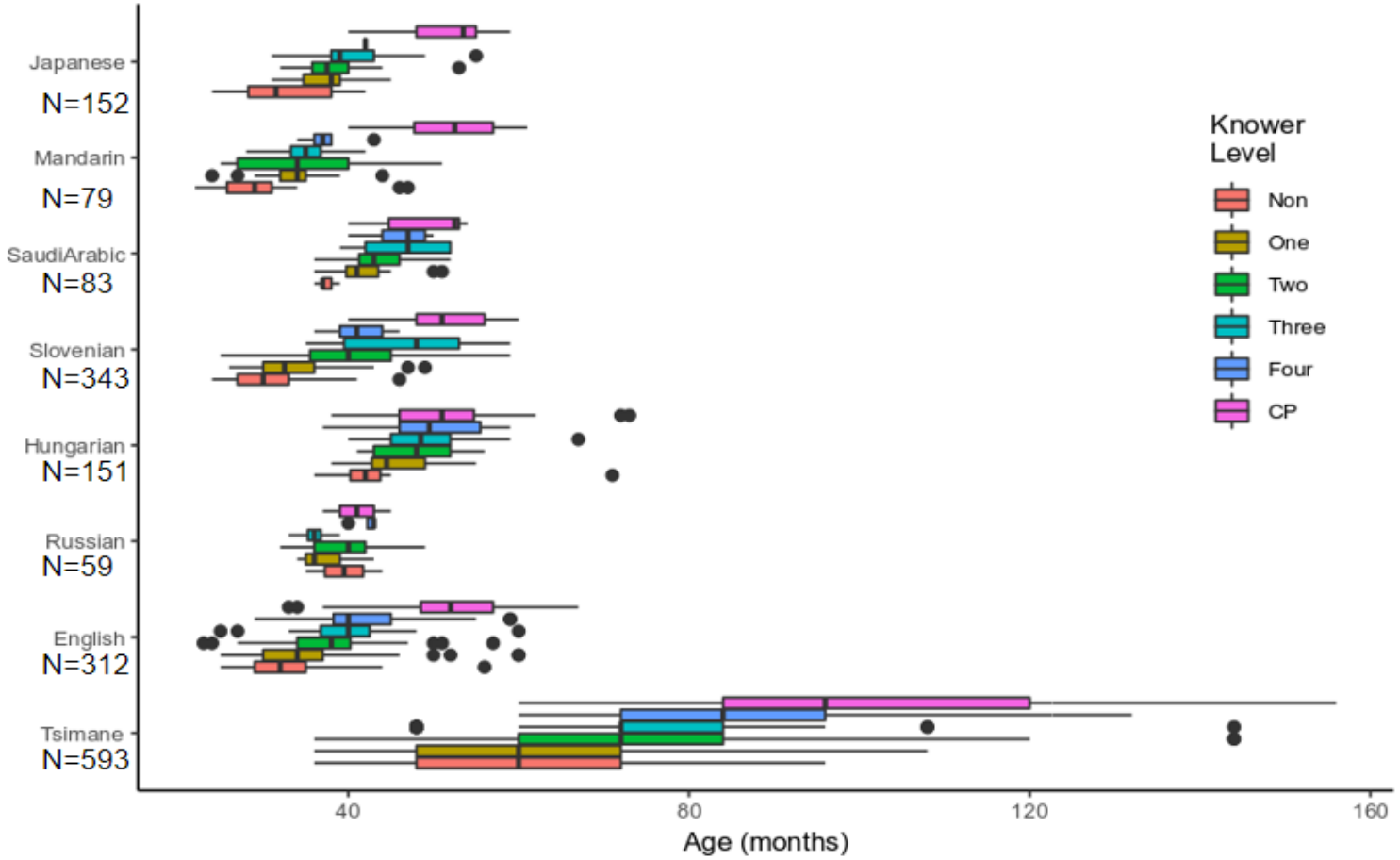

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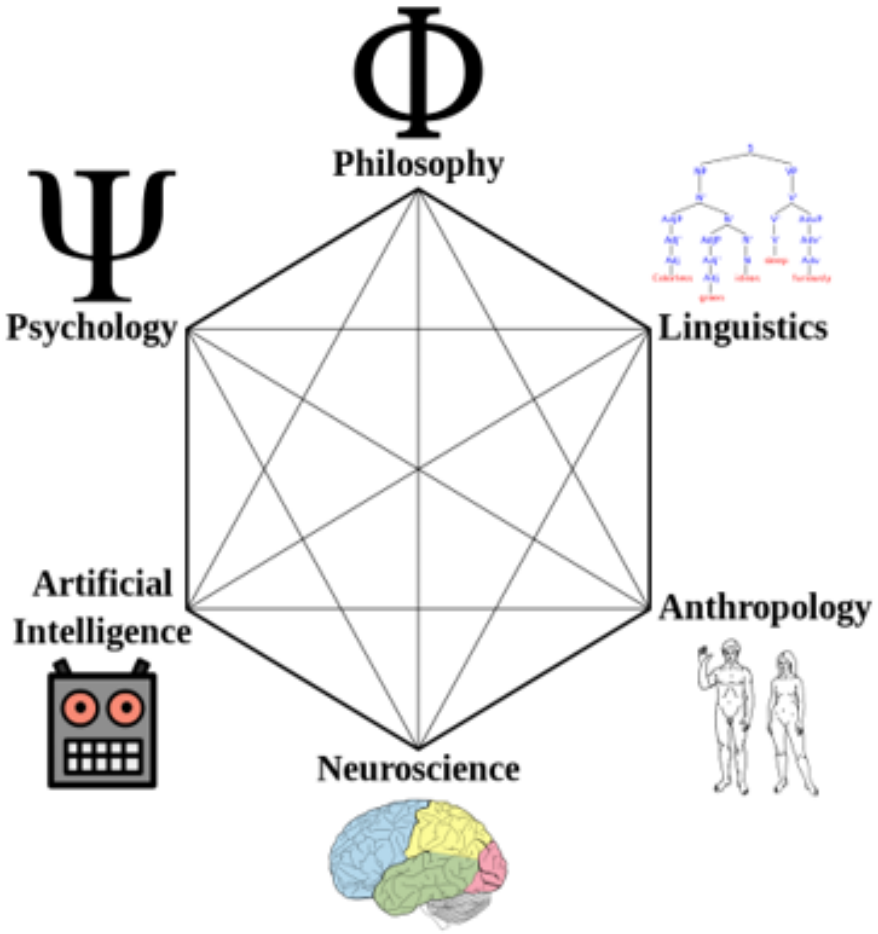
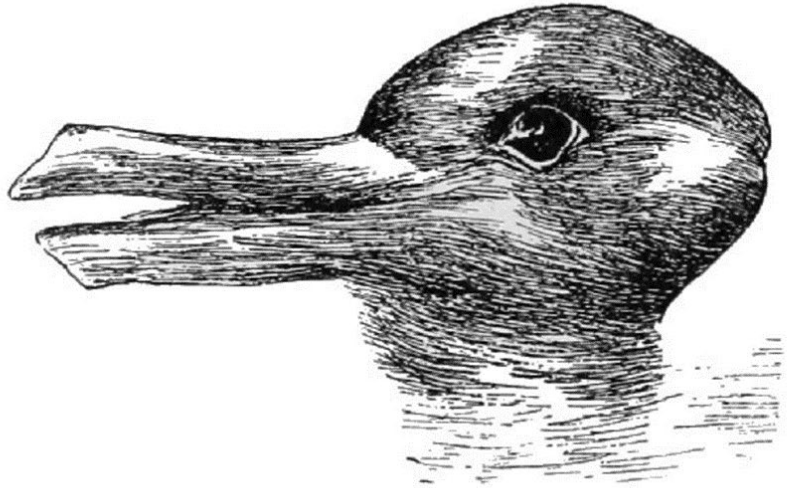


Philosophy

- Philosophy of Mind
- Philosophy of Language
- Philosophy of Computation
- Mental Architectures
- Mind-Body Relations: Embodied Cognition



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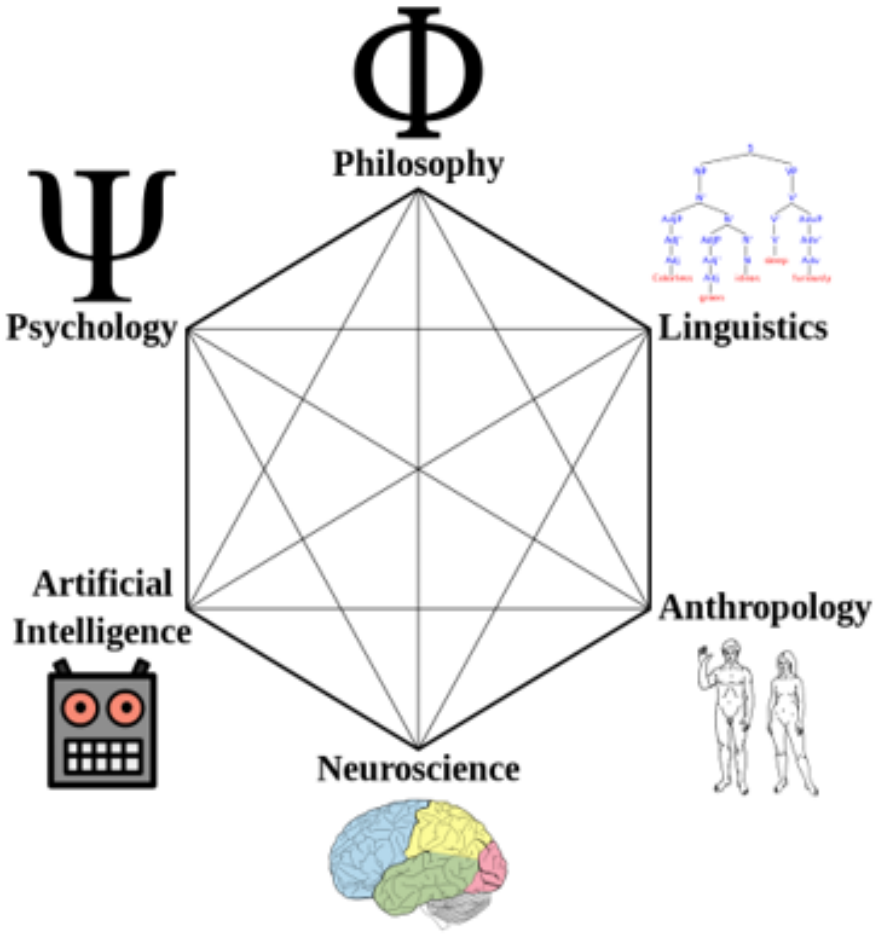
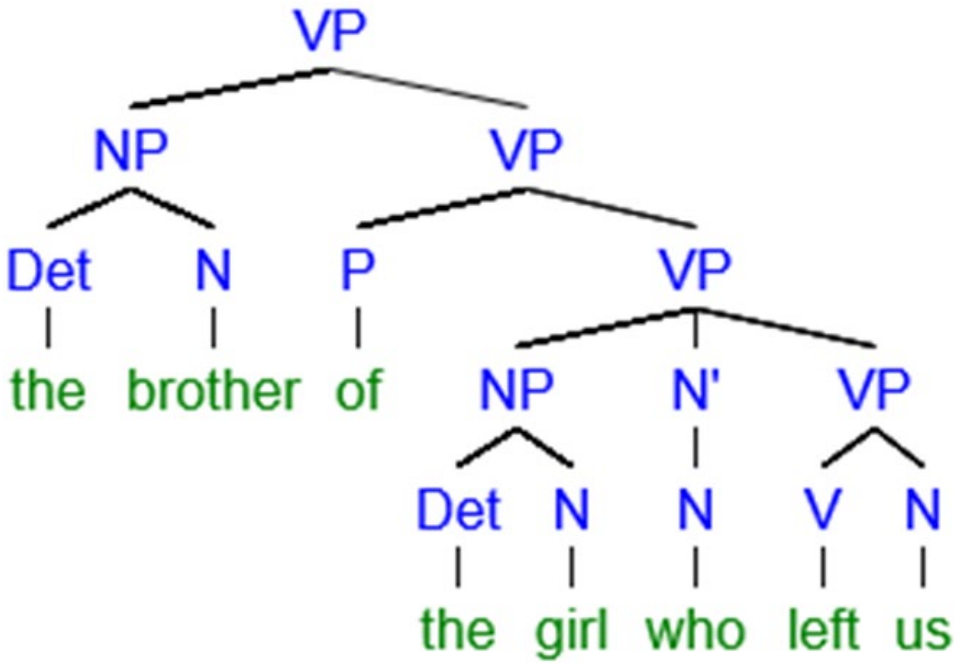
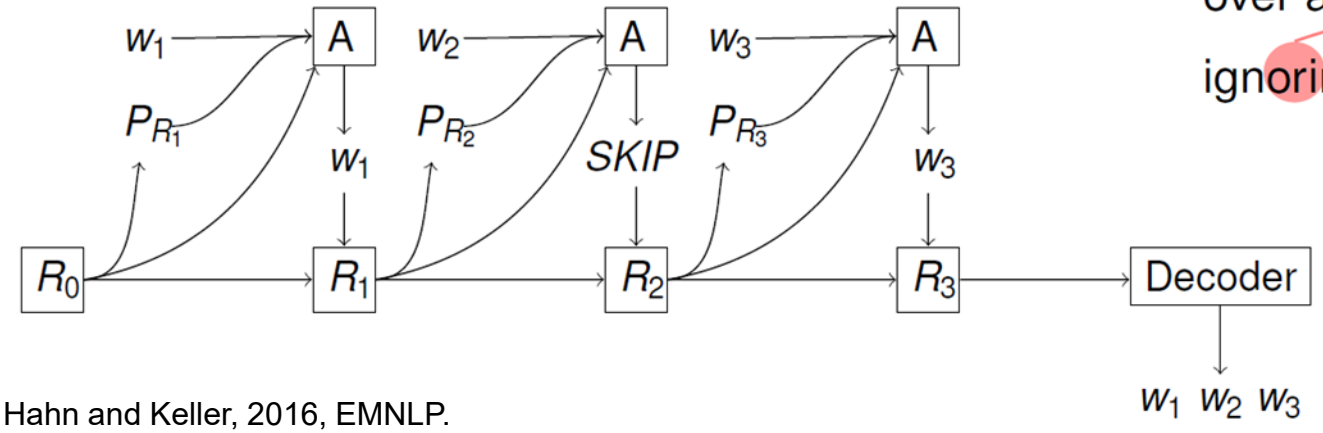


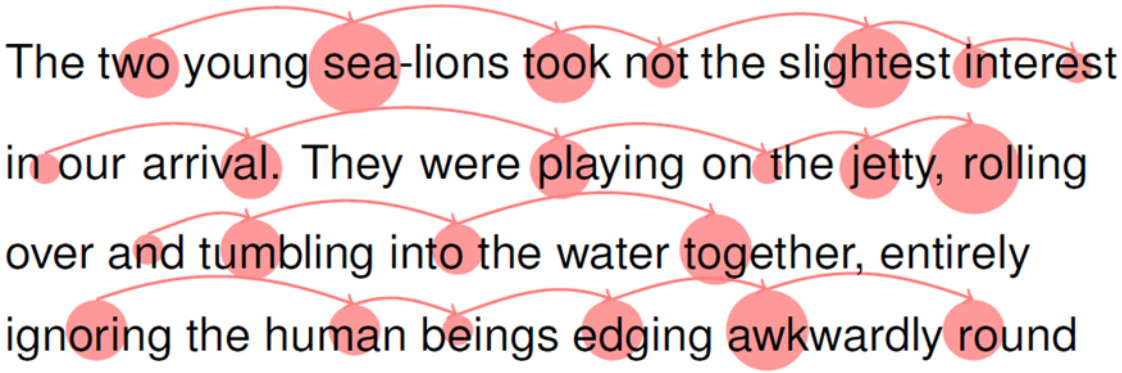
Linguistics

- Phonetics/Phonology
- Morphology
- Syntax
- Semantics/Pragmatics
- Sociolinguistics
- Psycholinguistics
- Historical Linguistics
- Language Evolution



Linguistics





Hahn and Keller, 2016, EMNLP.

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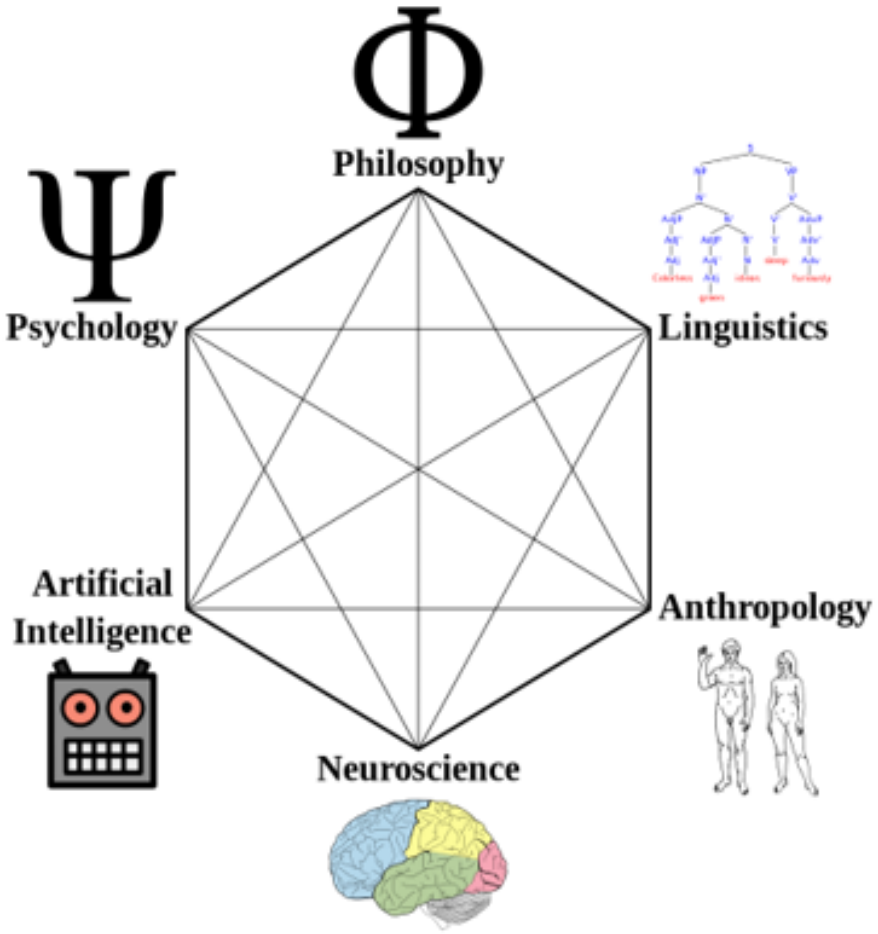
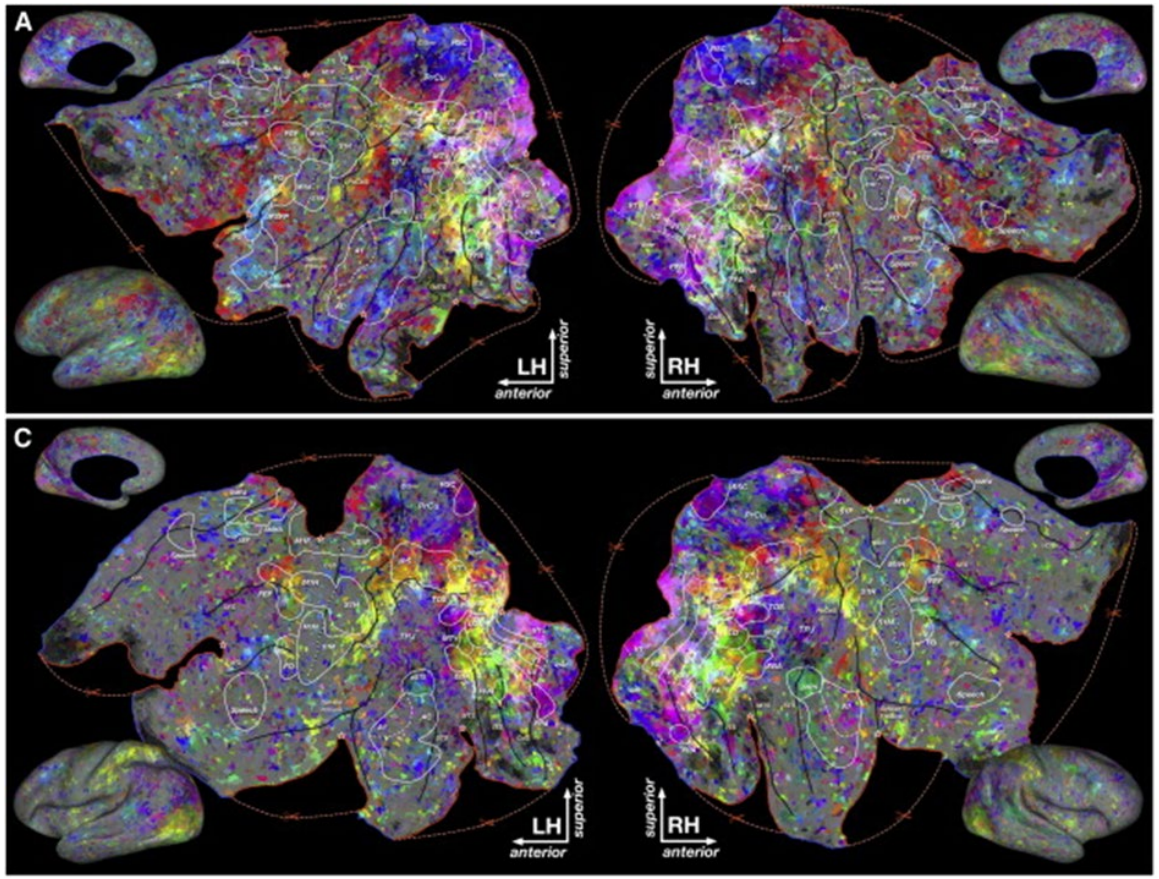
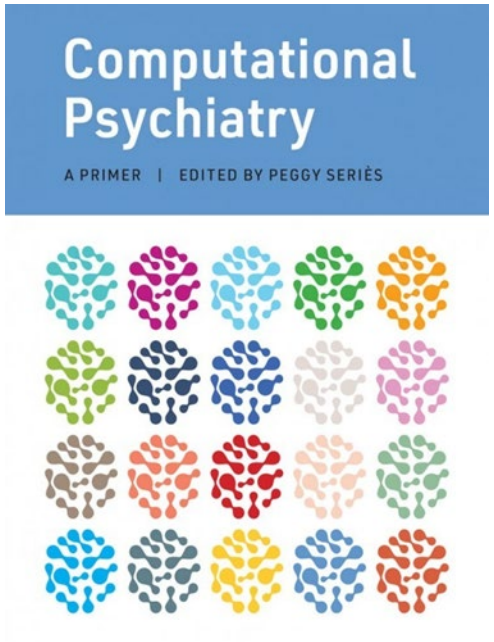
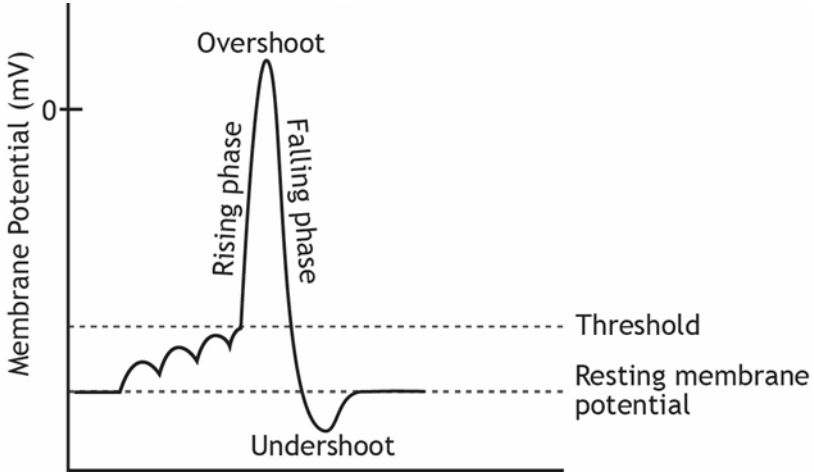


Neuroscience







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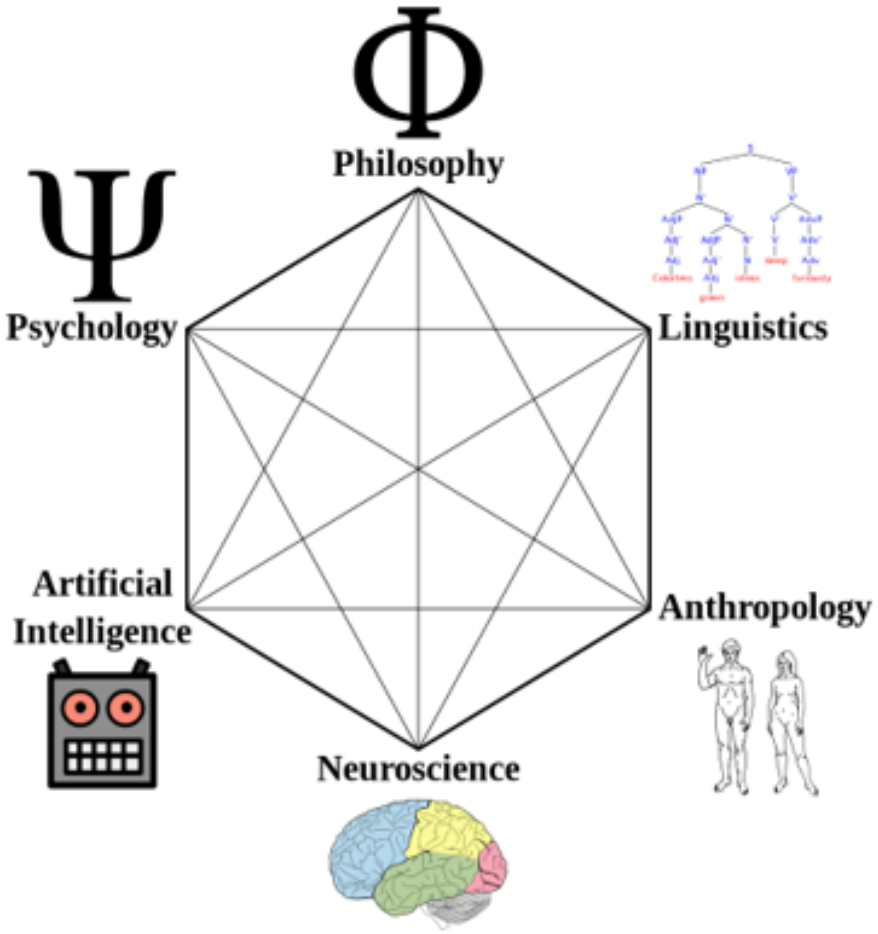
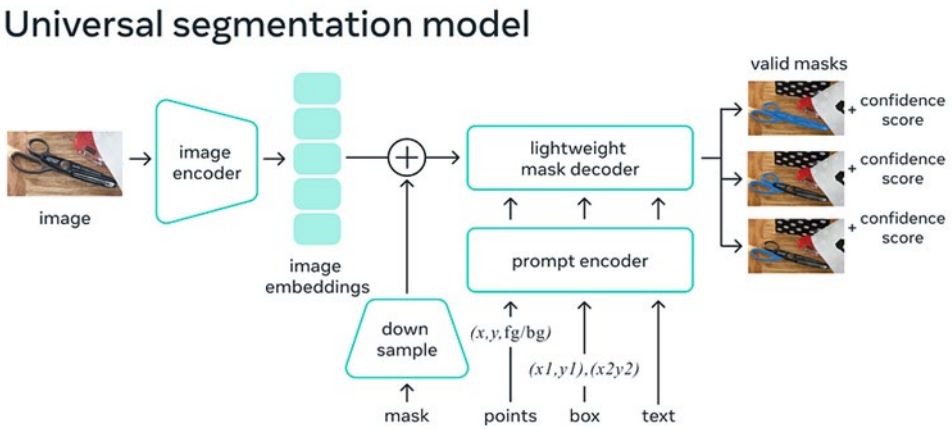


Artificial Intelligence

- Natural Language Processing
- Computer Vision
- Planning and Reasoning
- Robotics and Motor Control
- Machine Learning



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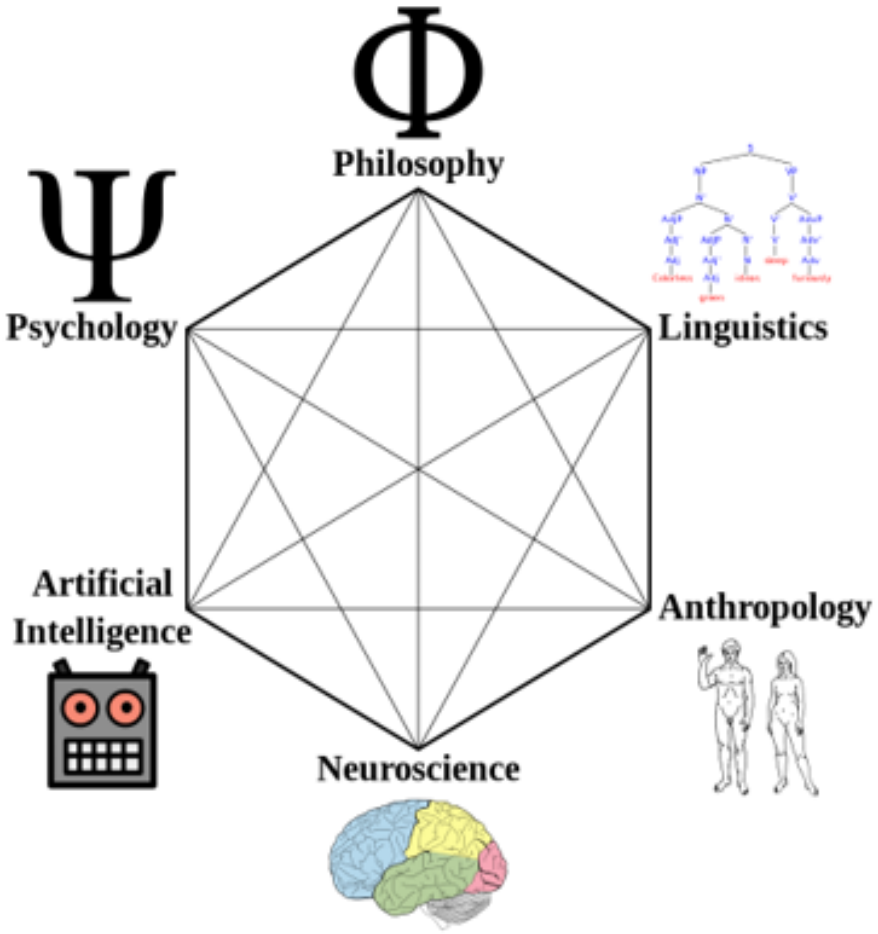

Graduate attributes

- Build and evaluate computational models of cognition
- Work confidently and collaboratively across disciplines
- Demonstrate proficiency in behavioural/computational research skills
- Communicate (oral and written) effectively to diverse stakeholders
- Demonstrate deep understanding of at least one specialist area of cognition:
    - Natural Language Processing
    - Computational Neuroscience

Cognitive Science MSc (180 credits)

2022/2023 Program

Mandatory Courses (100 credits)

Seminar in Cognitive Modelling
(S1+S2, 20 credits)

Computational Cognitive Science
(S1, 10 credits)

Informatics Project Proposal (S2, 10 credits)

MSc Dissertation (Summer, 60 credits)

Electives (60 credits)

Cognitive Science Courses (20 credits)

Computational Neuroscience (S1, 10 credits)
Computational Cognitive Neuroscience (S2, 10 credits)

Accelerated Natural Language Processing (S1, 20 credits)
NL Understanding Generation & MT (S2, 20 credits)
Speech Processing (S1, 20 credits)
Automatic Speech Recognition (S2, 10 credits)
Speech Synthesis (S2, 10 credits)
Simulating Language (S2, 20 credits)

Human-Computer Interaction (S1, 10 credits)
The Human Factor: Working with Users (S2, 10 credits)

Cognitive Science MSc (180 credits)

Electives (60 credits)

Informatics

Natural Computing (S1, 10 credits)
Bioinformatics (S1, 10 credits)

Algorithmic Game Theory (S2, 10 credits)
Methods for Causal Inference (S2, 10 credits)
Reinforcement Learning (S2, 10 credits)
Machine Learning (check for yourself)

Computer Graphics (S1, 10 credits)
Image and Vision Computing (S1, 10 credits)
Advanced Vision (S2, 10 credits)

Robotics: Science and Systems (S1, 20 credits)
…

Philosophy, Psychology & Language Science

Ethics of Aritificial Intelligence (S2, 20 credits)
…

Brain Imaging in Cognitive Neuroscience (S2, 10 credits)
…

Pragmatics (S1, 10/20 credits) Language Production (S1, 10 credits)
Online Experiment Design (S1, 10 credits)
Origins and Evolution of Language (20 credits)
…