

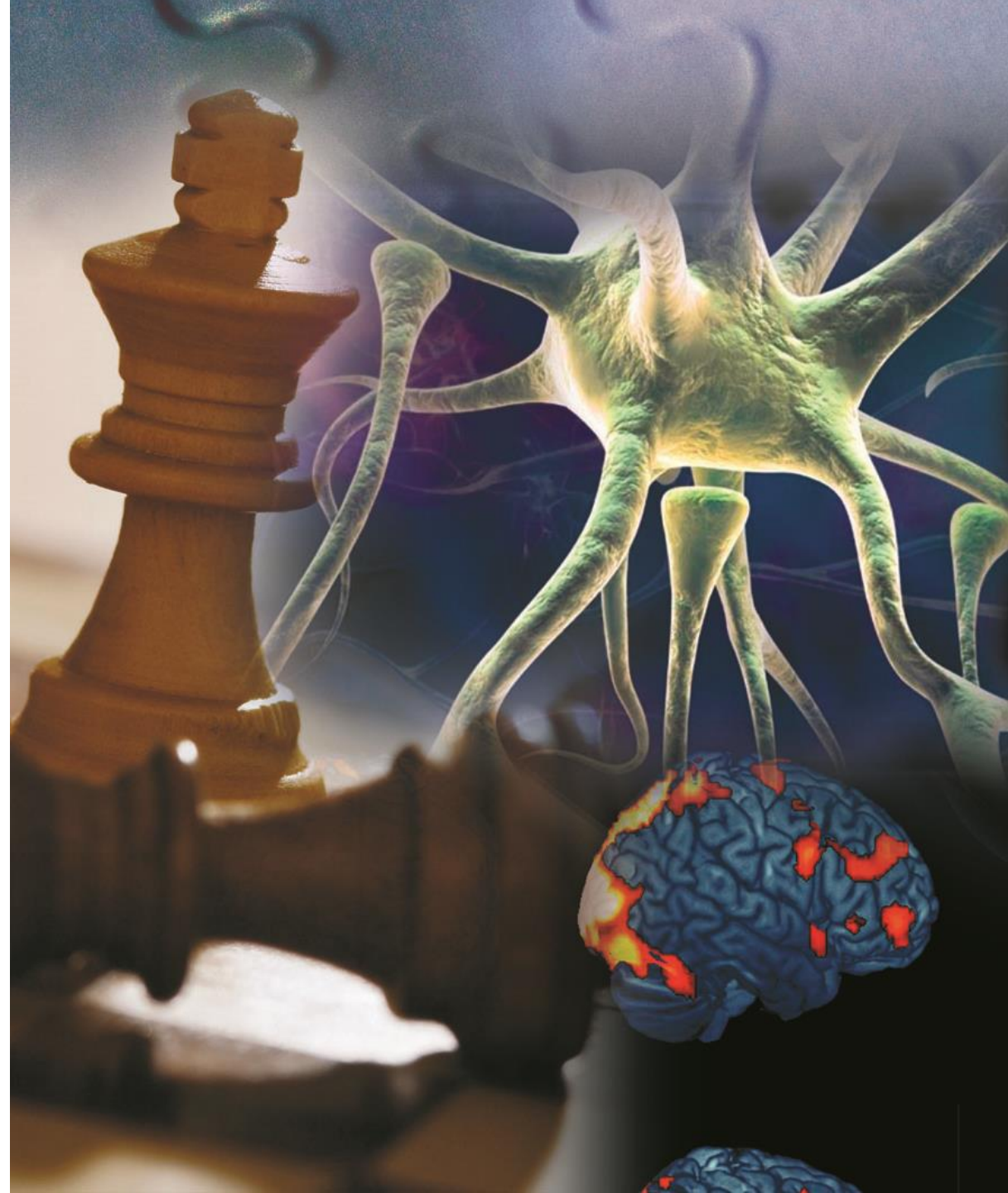


UNIVERSITY OF AMSTERDAM
Faculty of Science

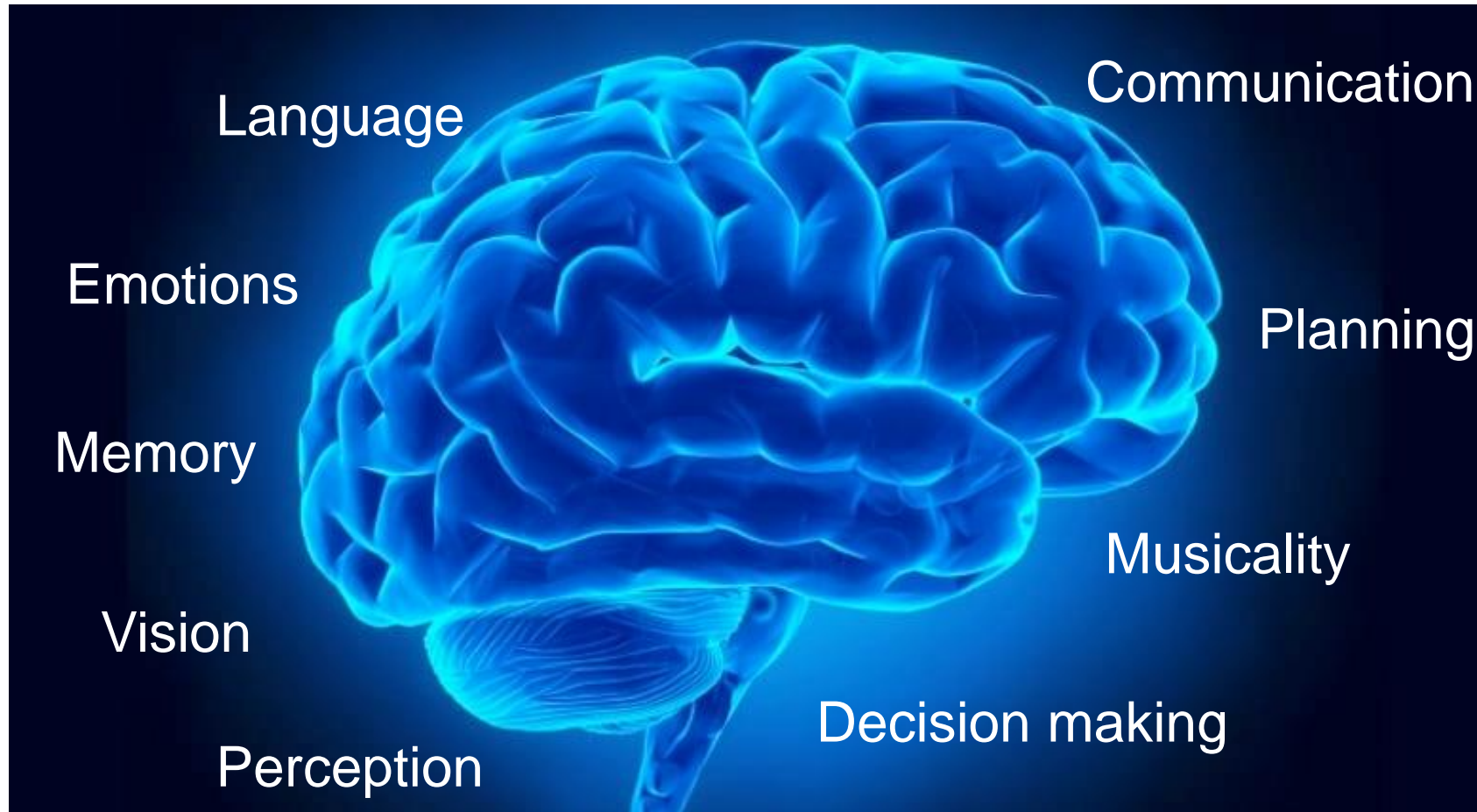
Brain and Cognitive Sciences: Crossing Boundaries

Dr. Umberto Olcese

February 15th, 2024

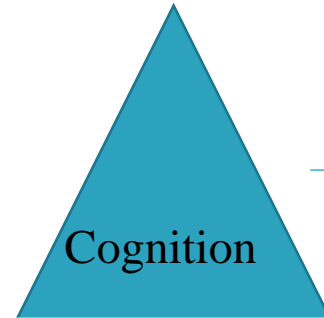


Brain and Cognitive Sciences

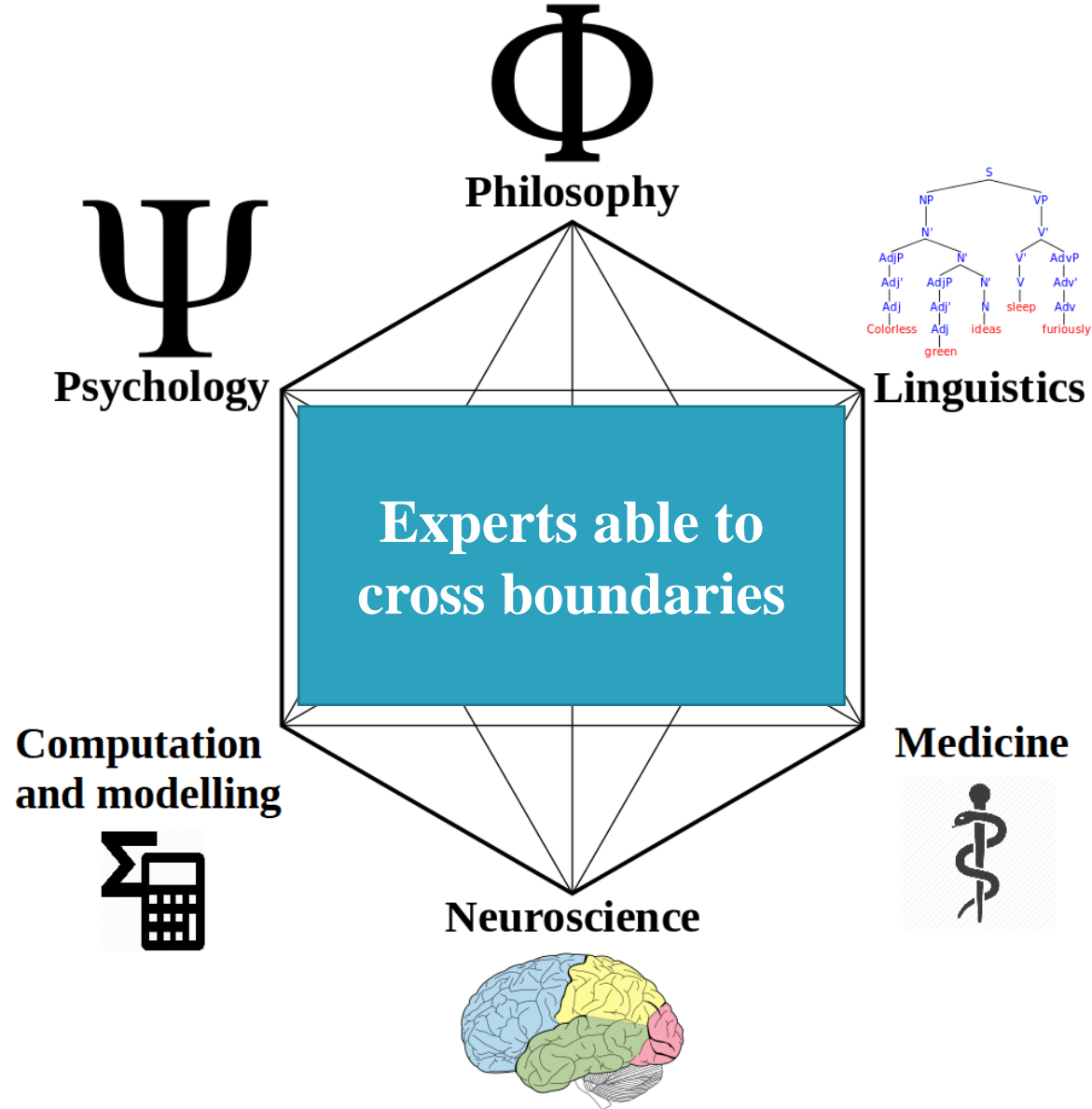




Brain and Cognitive Sciences



Cognitive psychology
Linguistics
Philosophy of mind
Logic
Artificial intelligence



Research master Brain and Cognitive Sciences



- ✓ Institute for Interdisciplinary Studies
- ✓ UvA's expert institute for interdisciplinary training



- ✓ Amsterdam Brain and Cognition Center
- ✓ Fosters interdisciplinary research
- ✓ Hosts Research Priority Area Brain and Cognition
- ✓ Scientific excellence



Contact and information



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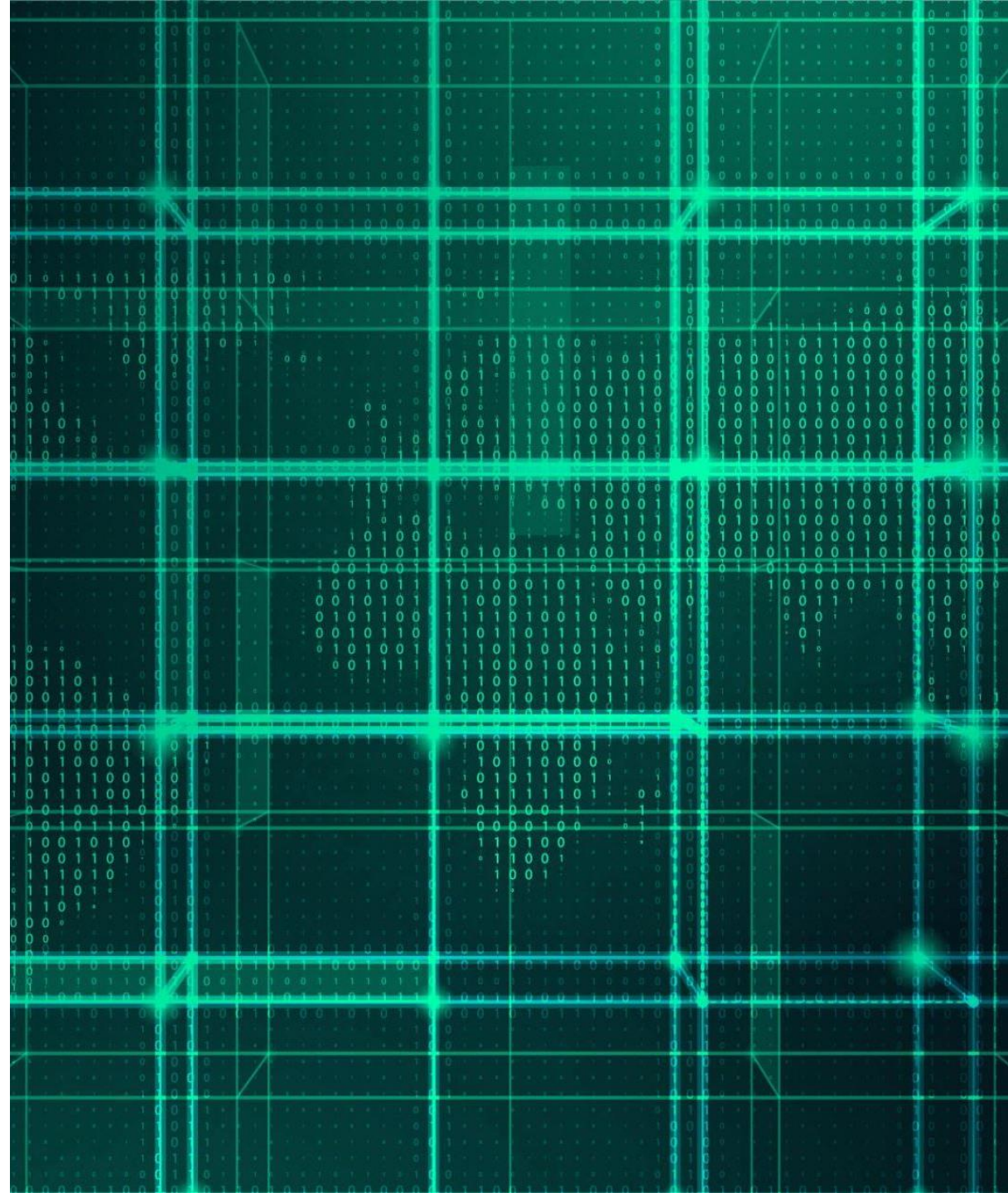


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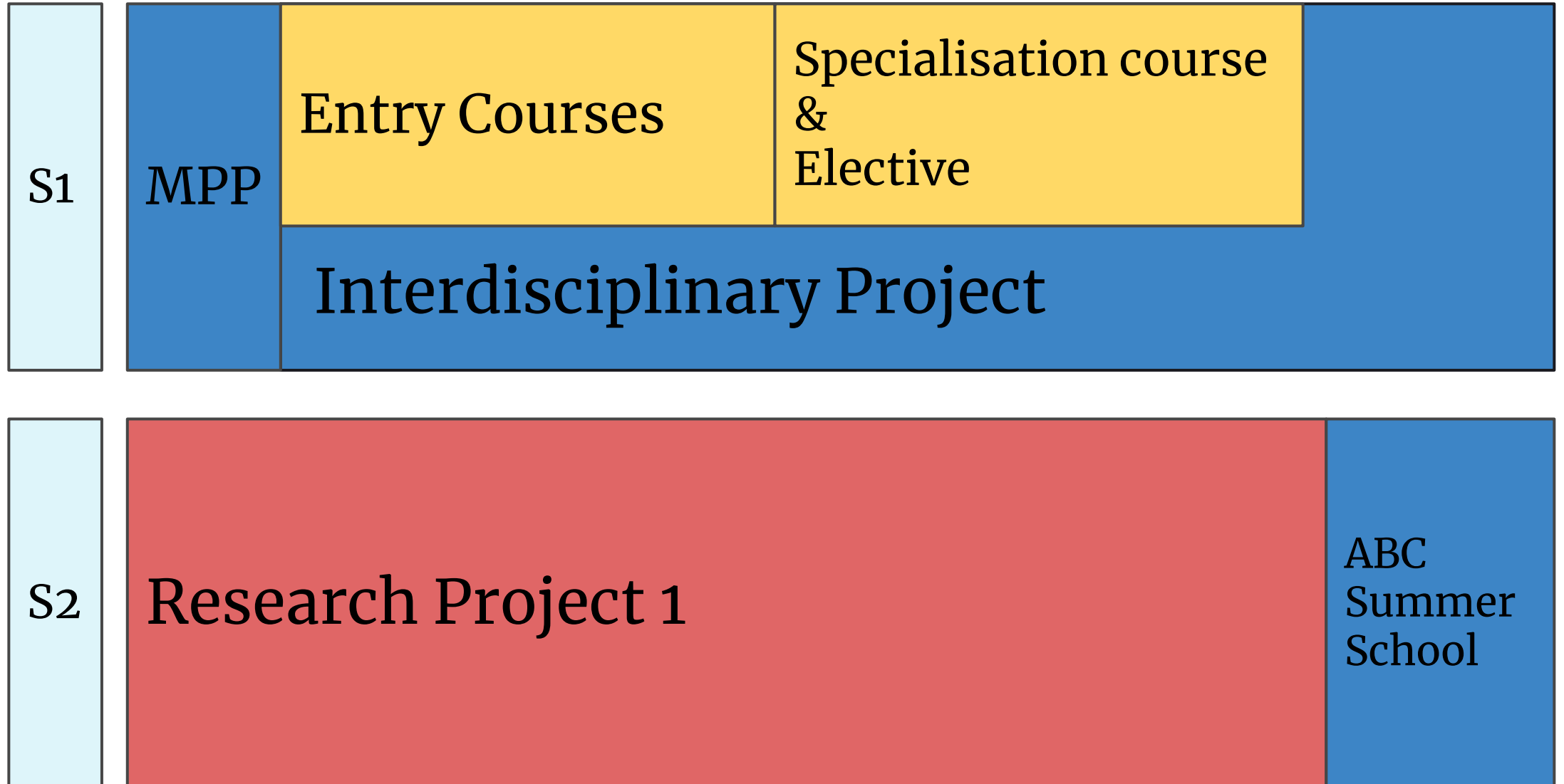


Educational Philosophy

- Research-intensive
- Small-scale classes
- Assessment-as-learning
- Interdisciplinary exchange
- Freedom of choice



Year 1



MPP: Milestones, promises and pitfalls



Year 2

S1	Literature Thesis	Elective(s)	Research Project 2
S2	Research Project 2		



Three domains (~20 students/domain)

- Translational Neuroscience
- Cognitive Neuroscience
- Cognitive Science





Translational Neuroscience (TNS)

From molecules to behaviour

Discover the mechanisms and processes that determine the development of neural systems and the control of behaviour, from molecules to neuronal networks.

Entry courses:

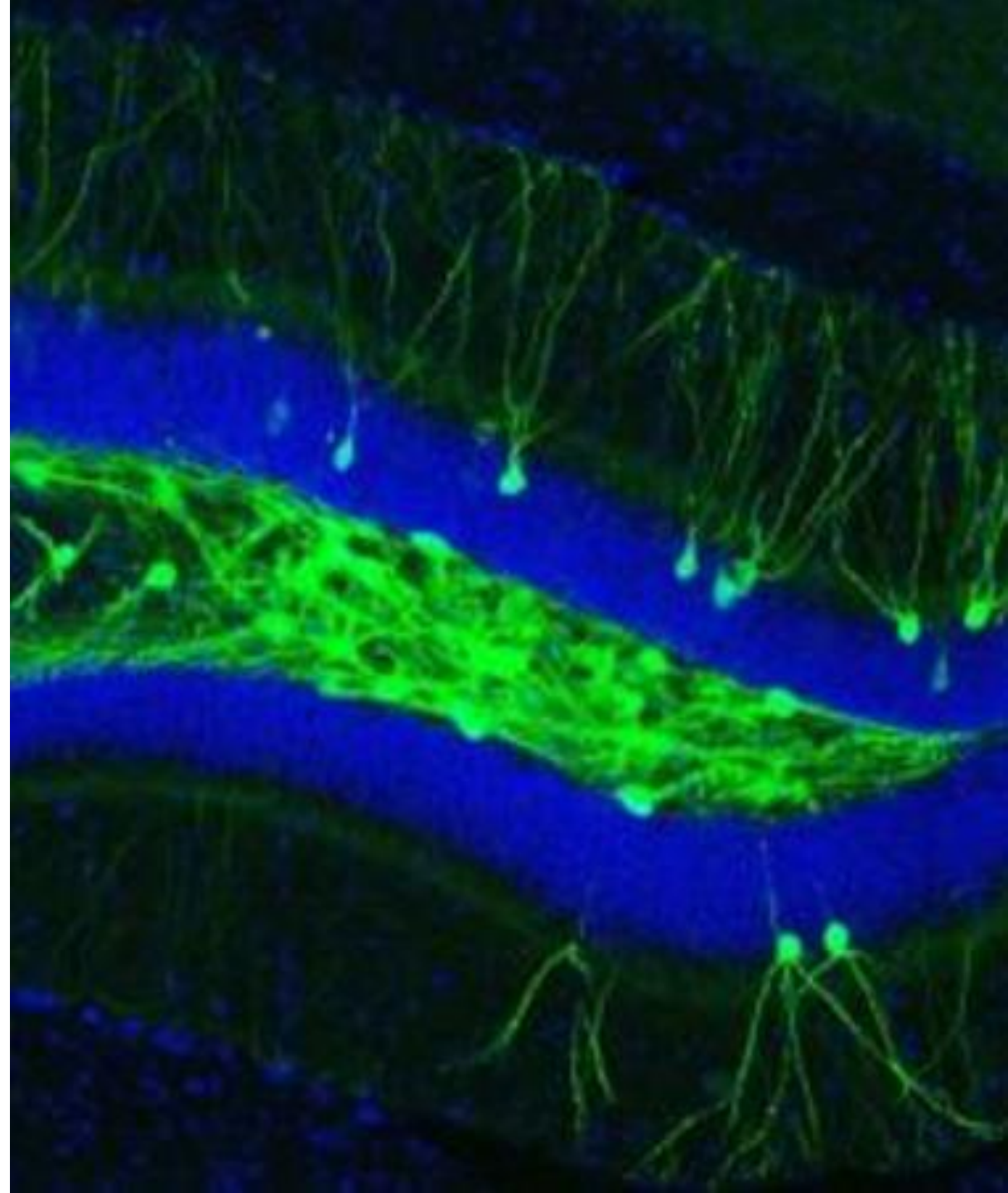
- Neuroscience: From cell to behaviour
- Experimental Neurobiology





Research projects TNS

- “Requirement of pain experience ACC neurons in freezing behaviour during pain observation”
- *Netherlands Institute for Neuroscience, NL*
- “Structural morphometry patterns across the incremental stages of cognitive decline in Parkinson’s Disease” *UvA, NL*
- “The Role of The Superior Colliculus in Express Reaches” *Gaze Control Lab, London, Canada*





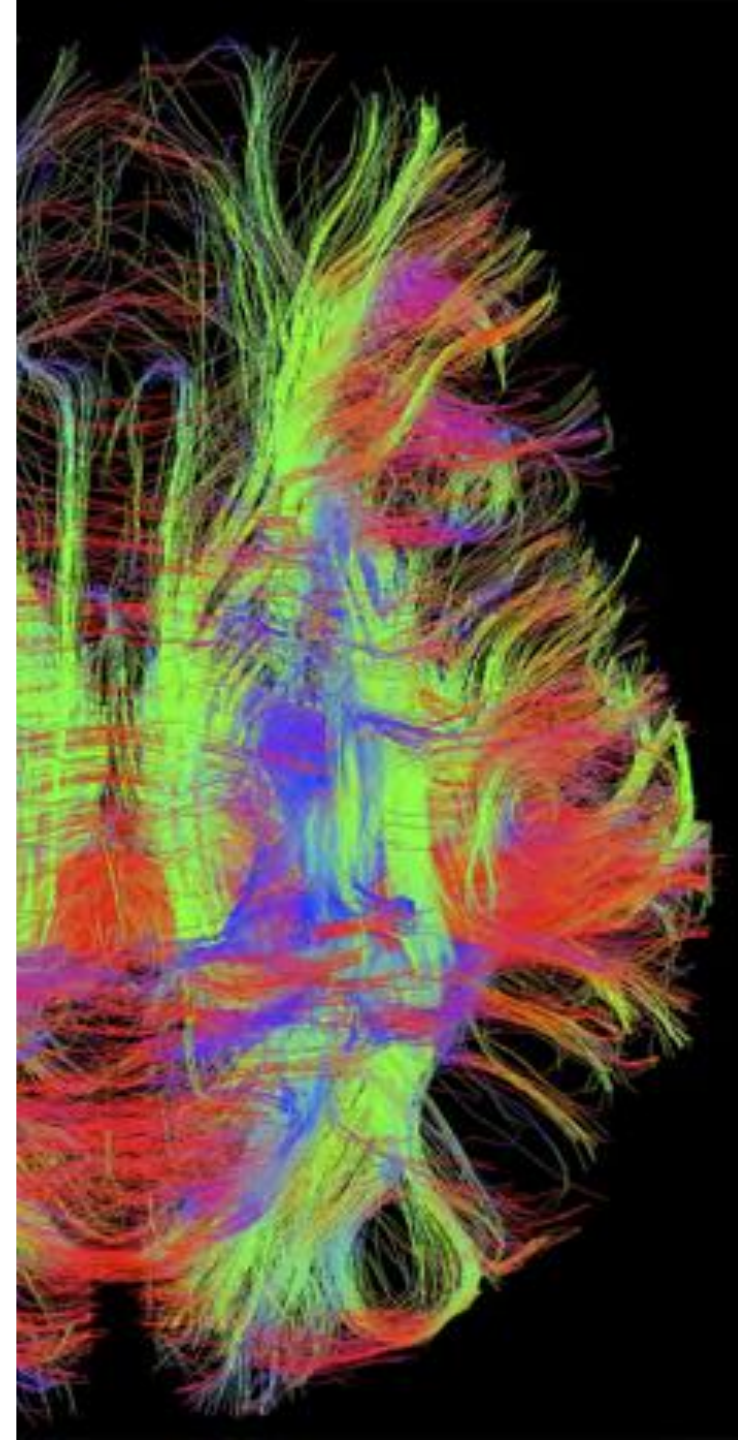
Cognitive Neuroscience (CNS)

The neural bases of cognition

Bring together neuroscience and psychology to understand the development and execution of cognitive functions underlying behaviour.

Entry courses:

- Brain Organization and Cognition
- Neurophysiology: Introduction to Electrophysiology and Imaging





Research projects CNS

- “Neural correlates of consciousness during epileptic seizures” *University of Wisconsin, USA*
- “This is Your Brain on Swearing: The Effect of Swearing on Error-Related Negativity as an Indicator for State Disinhibition.” *UvA, NL*
- “Representational dynamics in source space – interactions between lower and higher visual cortices” *University of Cambridge, UK*





Cognitive Science (CS)

Computational methods to study cognition

Discover the mechanisms of the mind and study cognitive and computational models to explore processes underlying language, music and other higher cognitive functions, whether in humans or artificial intelligence.

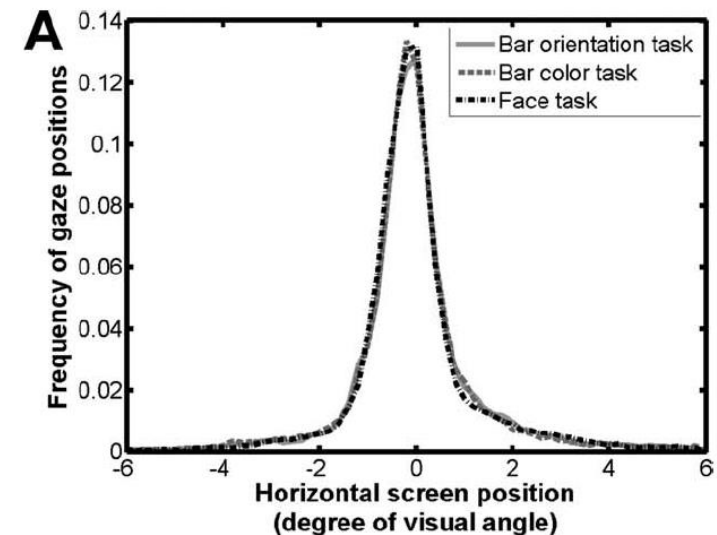
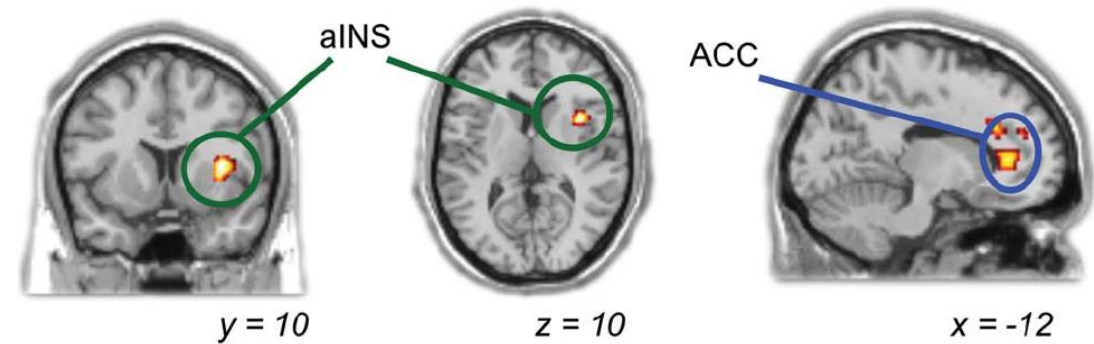
Entry courses:

- Higher Cognitive Functions
- Introduction to Computational Cognitive Neuroscience



Research projects CS

- “Spontaneous Vocal Behaviour in Grey Seal Pup Groups” *Seal Center Pieterburen, NL*
- “The Temporal Dimension of Self: Behavioral Effects and Underlying Mechanisms” *University of Ottawa, Canada*
- “Energy Optimization Induces Predictive-coding Properties in a Multicompartment Spiking Neural Network Model” *UvA, NL*



$$\Phi = \frac{1}{L} \sum_j \frac{P(D_j|old)}{P(D_j|new)} = \frac{1}{L} \sum_j \lambda_j$$



Specialisation courses

- Introduction to Python Programming for Neuroscientists
- Research Design & Statistics
- Neuroimaging: BOLD MRI
- Advanced Neural and Cognitive Modelling
- Cognitive Data Science: Genes, brains and behaviour





Electives (organised in-house)

- Cognition & Language Development
- Introduction to Python Programming for Neuroscientists
- Introduction to Neuroscientific Methods and Brain Anatomy
- Research Design & Statistics
- Advanced Neural and Cognitive Modelling
- Philosophy of Cognition and the Brain: From Neurons to Embodied Cognition
- How Music Works: Music Cognition
- Cognitive Data Science: Genes, brains and behaviour
- Digital twinning



Excellence and community

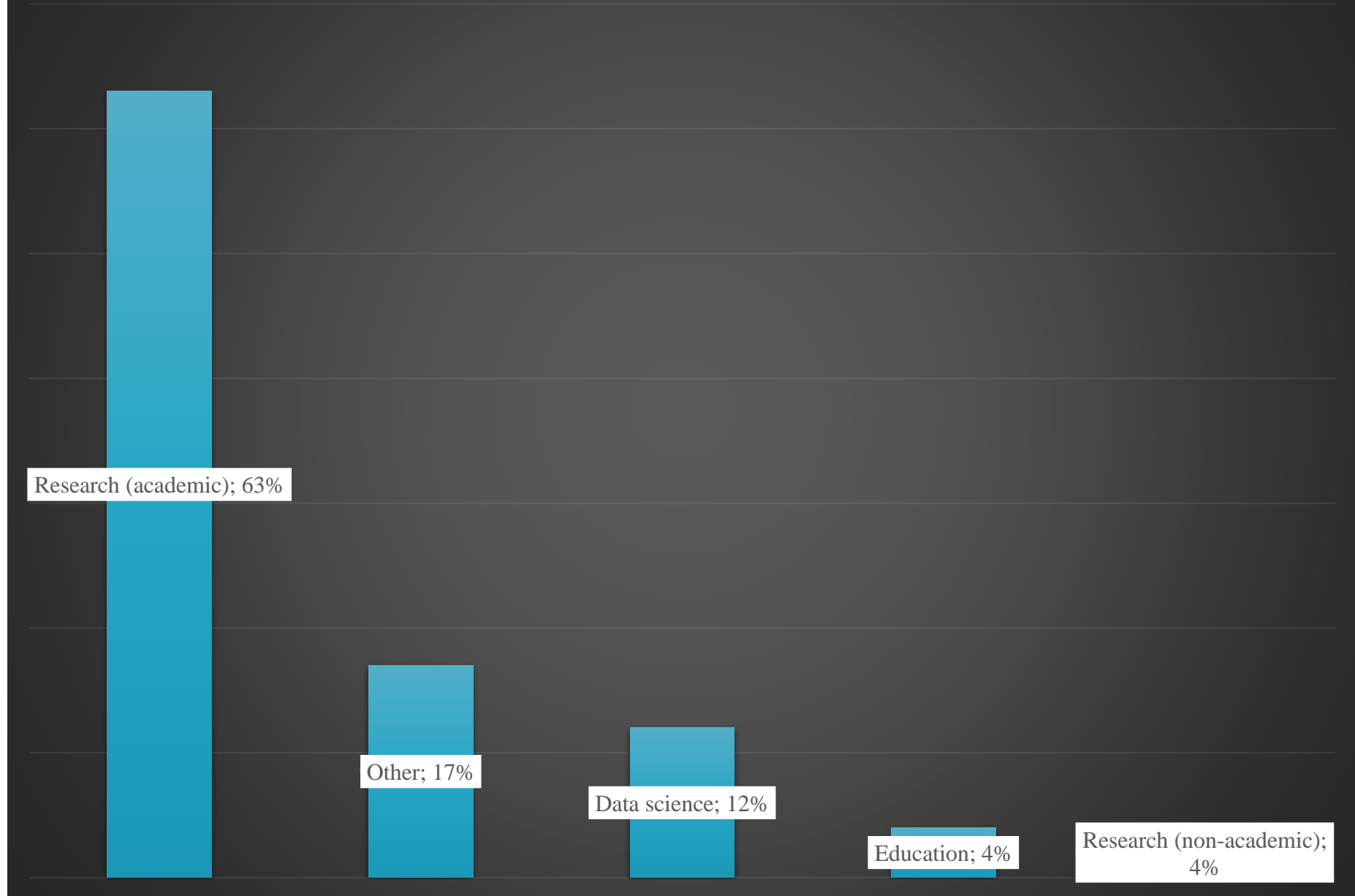
- Selective, full-time programme
- Emphasizes self-directed learning
- Community events:
 - Brain Slicing Event
 - Meet the Company
 - Cognitalks
 - Study trip
 - ABC Symposium



Graduates

(cohorts 2018 to 2020)

First job after graduation





Wouter van den Bos

Associate professor UvA, graduated 2006

“MBCS was perfect for an interdisciplinary career. I came in as a Philosophy student and out as a cognitive neuroscientist. Never learned so much in my life as in those two years. I liked it a lot that we were a small group of diverse students all doing the same courses.”





Barbara Braams

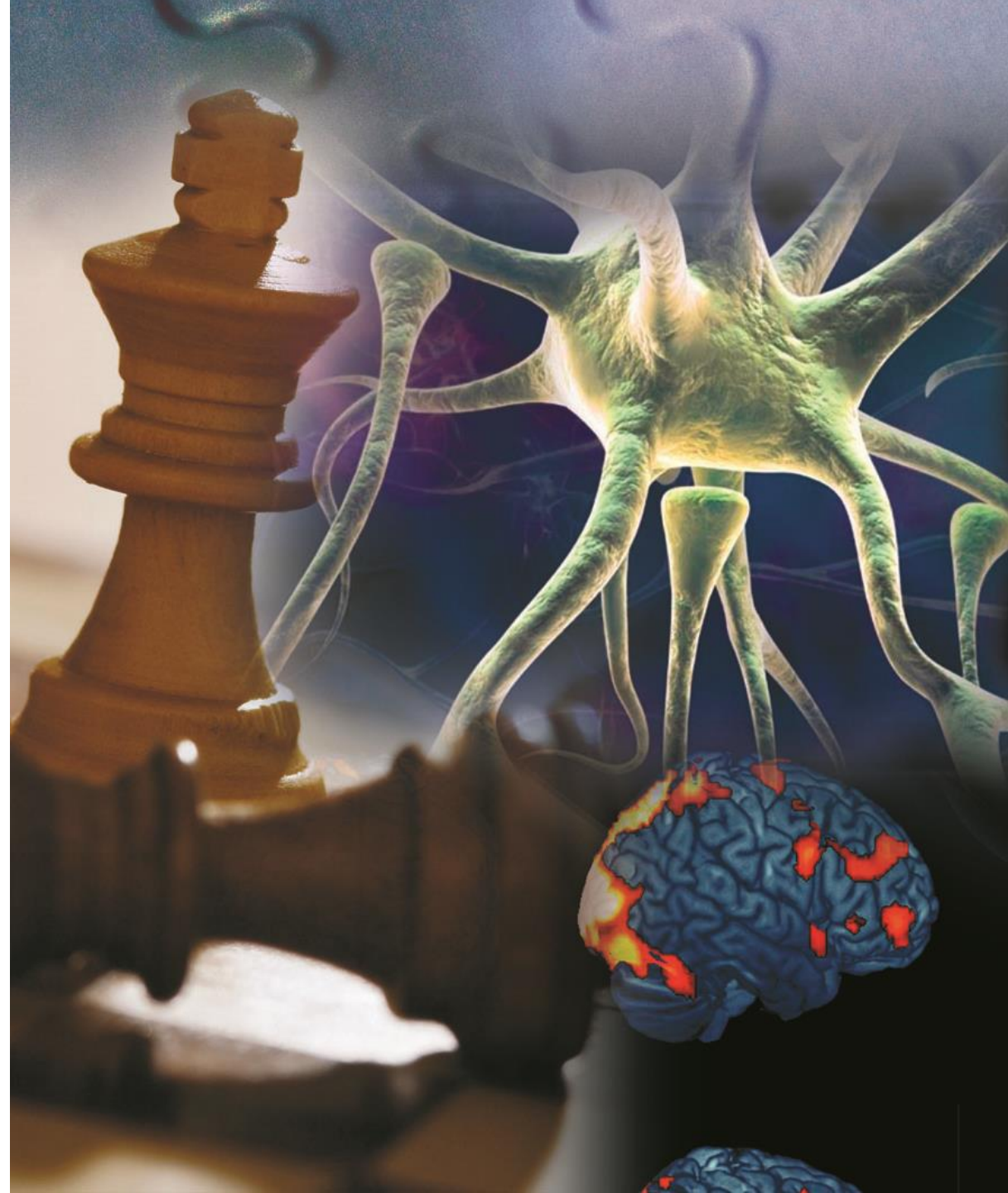
Assistant Professor VU, graduated 2010

“I loved the contact with fellow students working on completely different topics. Even now I regularly meet with many of them to hear about their current work. The small-scale education and intensive discussion taught me a lot.”



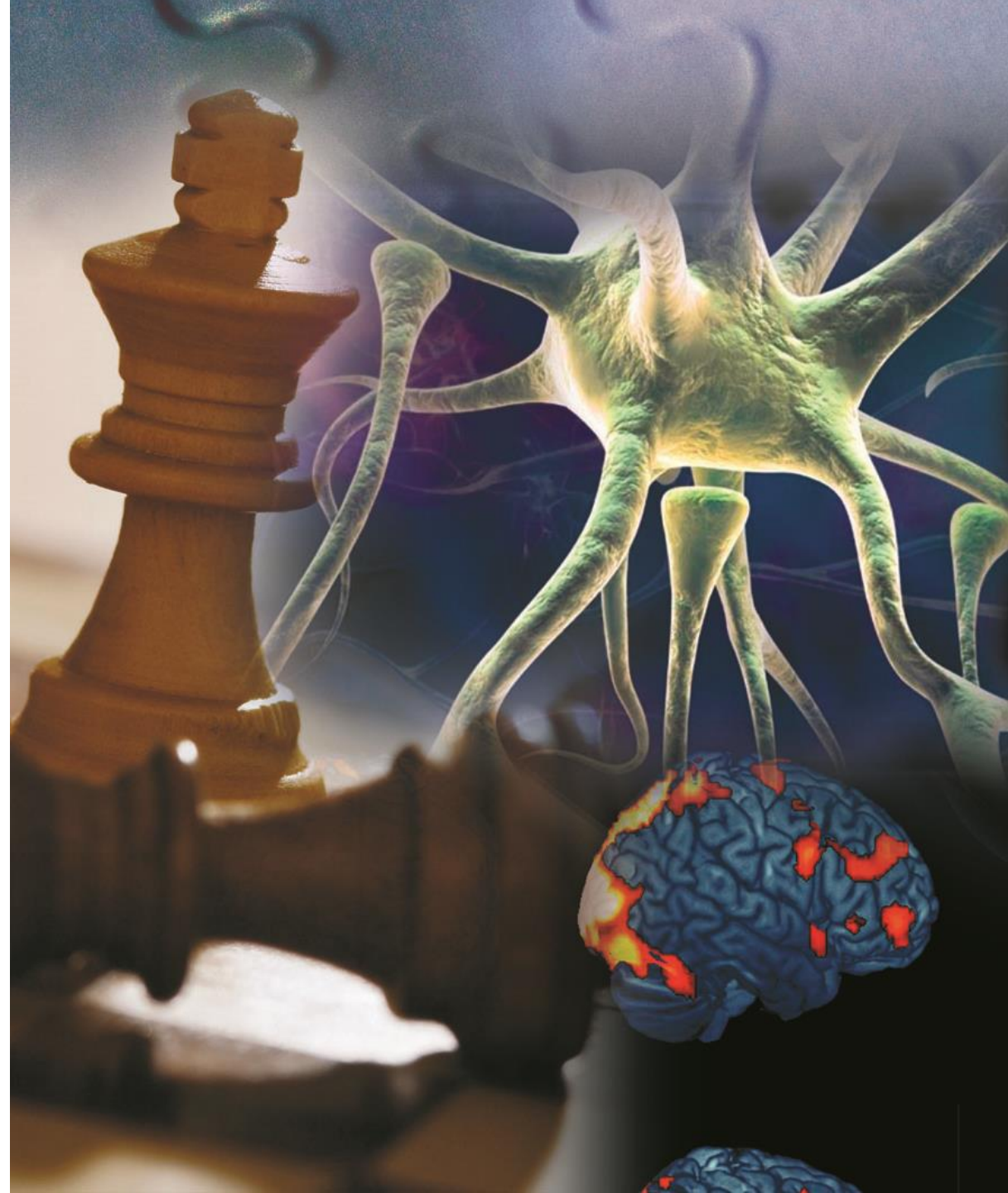
Selection process

- Admissions Board will review:
 - Motivation letter
 - Resume
 - Written work (e.g. BSc thesis)
 - Course transcript
 - GPA
- Immediate decision for top and bottom percentiles
- Rest ranked by score, decision in May



Selection criteria

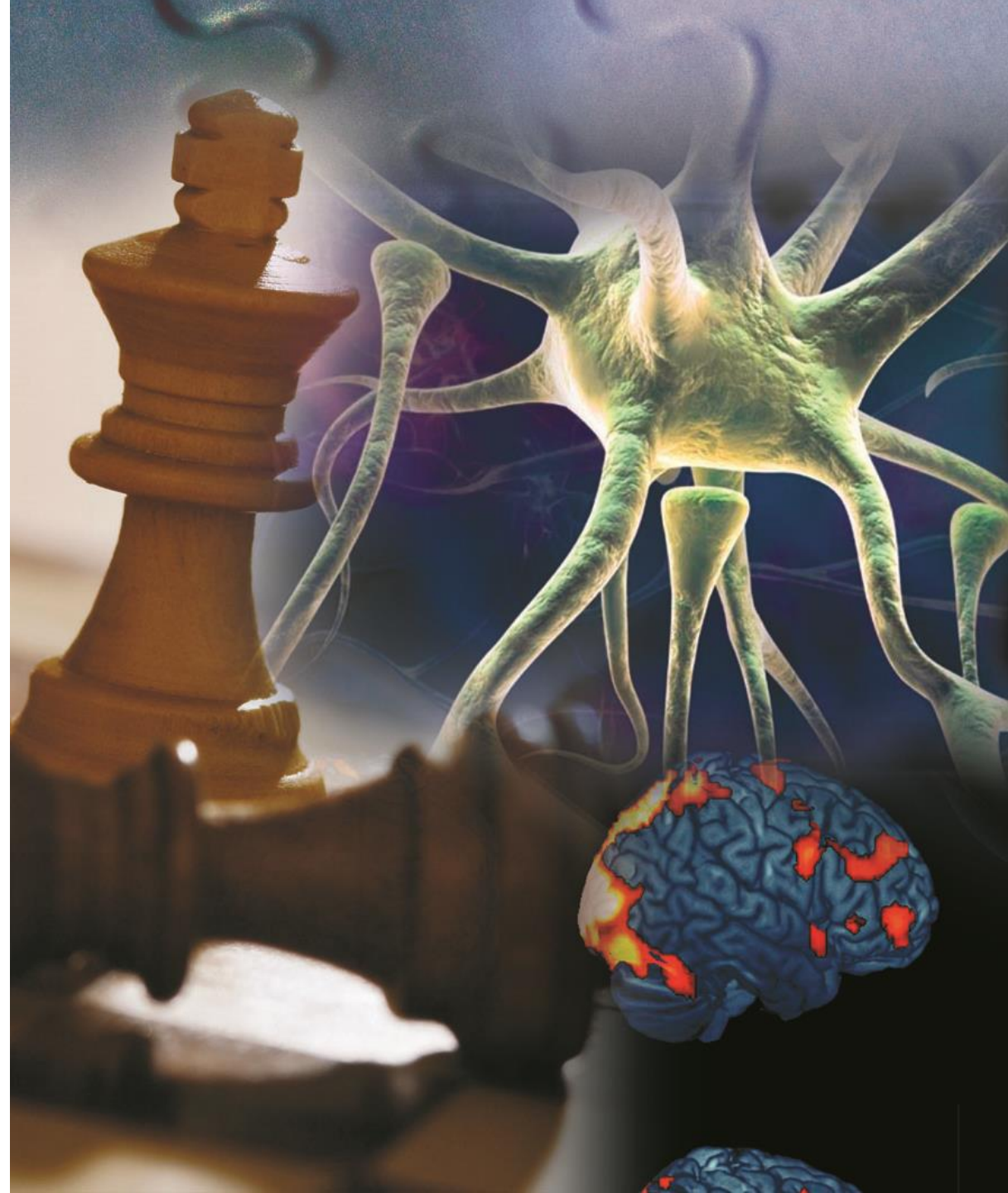
- Clear motivation for research in brain and cognitive sciences
- Coursework on neuroscience or cognition
- Research preparedness
- Interdisciplinary attitude
- GPA of 7.5 or higher
- Positive references





Want to apply?

- Applications are now open via Studielink
- See [our website](#) for more details
- Application deadline: April 30, 2024





Student experiences: Jorge, Anne Sophie and Max





Contact and information



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