

Research Group Prof. Dr. Tobias Schlicht

Master Project 1: Technology and Extended Cognition

A project could investigate the extent to which 4E cognition, in particular the extended mind thesis, has an impact on theories of cognitive phenomena and our coupling with current AI technology, e.g., Large Language Models. For example, the claim that cognition is embedded in the environment seems to stand in contrast to (and is weaker than) the claim that it extends into the environment (Clark 2008). Another aspect could focus on discussions of whether such Models can understand language, possess the constraints of being candidates of cognition and agency etc.

Literature

Clark, A. 2008 *Supersizing the Mind*. OUP

Newen, A., de Bruin, L., Gallagher, S. (eds.). 2018 *The Oxford handbook of situated cognition*. OUP

Chalmers, D. 2023. Could Large Language Models be conscious?

Yildirim I, Paul LA. 2024. From task structures to world models: what do LLMs know? *Trends Cogn Sci*. 28(5):404-415. doi: 10.1016/j.tics.2024.02.008.

Nyholm, S. (2023). *This is Technology Ethics*. Routledge.

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Master Project 2: Forms of Interaction

Debates on social cognition have sometimes proceeded without taking into account the role of interaction for understanding others. Recently, some philosophers have claimed that understanding others is partly constituted by the interaction process (deJaegher & Di Paolo 2007, Gallagher 2005). Yet, this claim is difficult to understand. What could it mean for an interaction to constitute thinking or understanding?

An alternative view on interaction would grant it only the role of an important background condition that is different from mere observation (Butterfill 2013). Even others uphold the individualistic approach to social cognition and distinguish between an I-mode and a We-mode (Gallotti & Frith 2012). Although it does not constitute understanding in any interesting sense, interaction changes the situation by opening up new routes for understanding and for gaining evidence about the other mind.

Technological advances allow for further new forms of interaction: between humans, smartphones allow for interaction in which several features of face-to-face interaction are maintained while others get lost, to do with embodiment etc. Moreover, interaction with social media involves the involuntary and maybe unknown interaction with bots who are not even agents. What is significant about these forms of social interaction? Further advances will allow us to interact with AI systems in the form of social robots in everyday situations, at the workplace, in daycare etc. An interesting project could discuss the various forms of interaction and develop a taxonomy of forms of interaction.

Literature

deJaegher, H., Di Paolo, E. 2007 Participatory sense-making, *Phenomenology and the cognitive sciences*

Gallagher, S. 2005 *How the body shapes the mind*, Oxford University Press.

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Master Project 3: Neuroscience of Consciousness

The major research program in neuroscience is the search for the neural correlate of consciousness (Metzinger 2000). Against skeptics who think that consciousness may be beyond the reach of natural science (Nagel 1974, 2013; McGinn 1990) most philosophers presuppose a naturalistic view of consciousness and its place in nature. This MA topic looks at the actual empirical science and reflects upon it from the vantage point of philosophy of mind and philosophy of science. What can a science of correlations show? Does the methodology of asking participants in experiments for reports misconceive of the phenomenon under investigation? That is, are these experiments only demonstrating the neural processes underlying cognition and report instead of consciousness? How could we bypass these confounds? What can no-report paradigms demonstrate (Tsuchiya et al 2016)?

Literature

Metzinger, T. ed. 2000 The neural correlates of consciousness

Nagel, T. 1974 What is it like to be a bat?

McGinn, C. 1990 Can we solve the mind-body problem?

N. Tsuchiya et al. (2015): No-report paradigms. extracting the true neural correlates of consciousness. *Trends in cognitive sciences* 19(12), 757-770.

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Master Project 4: Cognition in simple biological systems

Taking the theoretical proposal of autopoietic enactivism (Maturana & Varela 1980, Thompson 2007, DiPaolo, Buhrmann, Barandiaran 2017) seriously, it yields an explicit hypothesis about the natural origins of intentionality: Intentionality arises from the autopoietic structure (self-organization) of living beings. Maturana and Varela illustrate the autopoietic organization using the example of a single cell. The basic idea is that a molecular network constitutes the cell, and the interaction within this network produces the cell's boundary to the environment, i.e. its membrane. In order to maintain its identity and survive, the cell has biological needs that force it to interact with its physical environment. This self-world difference and the cell's biological needs yield an asymmetric dependence relation of the cell on its environment, which Thompson interprets as a basic biological form of intentionality, conceived as directedness. If we indeed take this to be a persuasive theoretical proposal about the origin of intentionality in biological systems, further questions arise: (1) Does the biological intentionality exhibited by "simple" biological systems such as single cells already constitute a case of cognition or should we conceive of this as a more basic biological phenomenon? (2) If single cells possess cognitive capacities (such as perception and action), then how should these capacities be explained, e.g. in terms of the framework of mental representations or in "purely" enactive terms, and if the latter is the case, what are these terms exactly? (3) Given that these biological systems lack brains and nervous systems but are nevertheless capable of basic cognition, can we reasonably speculate about the functions and reasons for the development of brain and nervous systems?

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Master Project 5: Cognition and Consciousness in AI Systems

The hype around recent developments in artificial intelligence calls for a discussion and consideration of potential forms of cognition and consciousness in such systems, e.g., large language models. Are current such systems conscious? If not, what are they lacking? And what is the relation between artificial general intelligence and consciousness in such systems?

Moreover, given technological possibility, should we build such systems? What may be ethical considerations speaking in favor or against such developments?

Literature:

Nyholm, S. (2023). *This is Technology Ethics*. Routledge.

Butlin, P. et al. 2023. Consciousness in AI: Insights from the science of consciousness. ArXiv <https://arxiv.org/abs/2308.08708>.

Aru, J., Larkum, M., Shine, J. 2023. The feasibility of artificial consciousness through the lens of neuroscience. *Trends in Cognitive Sciences* 46(12), 1008-1017.

Dung, L. 2025 Consciousness without biology. An argument from anticipating scientific progress (manuscript)

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Master Project 6: Phenomenal and Access Consciousness

The Philosophy and Neuroscience of Consciousness had been dominated by the distinction between phenomenal and access consciousness, suggested by Block 1995, and Chalmers 1996. After 30 years, it is time to take stock and see if this conceptual distinction has yielded fruitful empirical research and whether the field has made any progress. This thesis could have a look at philosophical criticisms and empirical work that came out of this suggestion.

Literature:

Block, Ned 1995. A confusion about a function of consciousness. BBS

Chalmers, David 1996. The conscious Mind. OUP.

Schlicht, Tobias 2012. Phenomenal Consciousness, Attention, and Accessibility. *Phenomenology and the Cognitive Sciences*

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