
European Colloquium on Philosophy of Life Sciences – *EUPhilBio*

May 5th – 6th, 2022

Zagreb, Croatia

Scientific Program of *EUPhilBio_2022*

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EUPhilBio_2022

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Thursday, May 5th

09:30 – 09:45	Coffee/Refreshment
09:45 – 09:55	Get-together with Faculty officials
Closed Session I ¹ , Chair: Petar T. Mitrikeski	
10:00 – 11:00	Contemplating the Future of EUPhilBio – First Parley
11:00 – 11:15	Short pause
11:15 – 12:00	Contemplating the Future of EUPhilBio – First Parley continuation
12:00 – 12:45	Light lunch
Open Session I ²	
12:45 – 12:50	Opening address
12:50 – 12:55	Introducing the lecturer
13:00 – 13:45	Eörs Szathmáry [*] (Centre for Ecological Research ^A) <i>The nature and origin of (simple) life</i> [†]
13:45 – 14:15	Discussion (Chair: Nenad Raos)
14:15 – 14:25	Short pause
14:25 – 14:30	Introducing the lecturer
14:30 – 15:15	Arnon Levy (Hebrew University of Jerusalem ^B) <i>Biological machines: a sober defense</i>
15:15 – 15:45	Discussion (Chair: Franz Klein)
15:45 – 16:15	Short get-together in the open (end of Working Day 1)
16:15 – 18:30	Free time
Non-Session	
19:00 –	Gathering together over dinner



Friday, May 6th

09:45 – 10:00	Coffee/Refreshment
Closed Session II , Chair: Predrag Šustar	
10:00 – 11:00	Conceiving EUPhilBio_2023 – Second Parley
11:00 – 12:00	Light lunch
Open Session II	
12:00 – 12:45	Eörs Szathmáry <i>Is evolution open-ended?</i>
12:45 – 13:15	Discussion (Chair: Mauro Santos Marañó)
13:15 – 13:30	Short pause
13:30 – 14:15	Arnon Levy <i>Can Bayesian models in cognitive neuroscience show that we are rational?</i>
14:15 – 14:45	Discussion (Chair: Darko Polšek)
14:45 – 14:50	Closing address
14:50 – 15:30	Short get-together in the open (end of Working Day 2)
Panel discussion , Chair: David Immanuel Dunér	
15:30 – 17:00	No-agenda discussion ³

^A Institute of Evolution, Centre for Ecological Research, Budapest

^B Department of Philosophy, Faculty of Humanities, Hebrew University of Jerusalem

* See short CVs below

† See all summaries below

¹ Closed sessions only for hosts, lecturers and high guests (Faculty Hall)

² All talks at Open sessions are 45 min + 30 min discussion (Hall: p. Peter-Hans Kolvenbach SJ)

³ Possible extension till 18.00 h if necessary

CVs

Eörs Szathmáry

Eörs Szathmáry is a Hungarian theoretical and evolutionary biologist, best known for his continued work on the comparative and theoretical aspects of the major evolutionary transitions. The theme was set by a book that he published together with the late John Maynard Smith in 1995. This monograph and the subsequent popular book have been published in a dozen countries. In addition, Szathmáry studies replicator theory, the relationship between learning and evolution, the question of minimal life and the conditions for open-ended evolution. He is a member of the Hungarian Academy of Sciences, EMBO, the Norwegian Academy of Sciences and Letters as well as Academia Europaea.

Arnon Levy

Arnon Levy is associate professor of philosophy at the Hebrew University of Jerusalem. He holds a PhD in philosophy and an MA in biology, both from Harvard University. His research focuses on explanation and modeling in biology, as well as in some parts of neuroscience. He has written on machine analogies in molecular cell biology, on the notion of biological information in genetics and on the nature of mechanistic explanation. More generally, he is interested in how science handles complexity, especially those complex phenomena we call living creatures.

Summaries

Eörs Szathmáry

Lecture 1 | *The nature and origin of (simple) life*

Summary

The phenomenon of life can be conceptualized from a number of perspectives. The origin of life is a vexing problem for which the different insights must be put together. Criteria of life are phenomenological, while concrete living systems have specific organizations. I shall highlight what I consider, at the present state of knowledge, the most fruitful approach to minimal living systems, and what this brings us in terms of the origin of life here and elsewhere.

Lecture 3 | *Is evolution open-ended?*

Summary

Evolution by natural selection seems to be a process of unlimited unfolding. Models of evolution so far have failed to mimic this unlimitedness in a non-trivial way. The different types of open-endedness (weak, strong and ultimate) will be discussed, and the reasons for the difficulties to implement them *in silico* will be explained. Although evolution has algorithmic components, the process as a whole may not be algorithmic.

Summaries (continuation)

Arnon Levy

Lecture 2 | *Biological machines: a sober defense*

Summary

Analogies between biological systems and manmade machines are common across a wide variety of contexts, from molecular biology to physiology, guiding investigative and explanatory practice in important ways. Increasingly, however, they have come under scrutiny from both scientists and philosophers (Kirchner et al. 2000; Karagiannis et al. 2014; Nicholson, 2013, 2019). Critics claim that living systems differ in fundamental ways from engineered machines, and that the analogy is obsolete given recent experimental and theoretical advances. My goal in this paper is to clarify and evaluate the machine analogy, and to offer a qualified defense of it.

The main criticisms of the machine analogy appear to be: (1) It exaggerates the degree to which biological systems are deterministic. (2) It incorrectly assumes that biological mechanisms consist of a set menu of parts and a fixed layout. (3) It obscures the fact that biological systems at the molecular level operate in a thermal, rather than a macroscopic-mechanical, environment. (4) It is incompatible with the fact that biological systems are oftentimes self-organizing and dynamically stable.

I begin by arguing that the propriety of machine analogies depends on both the types of systems we are aiming to explain, and on the aspects/behaviors we are focusing on. In biology, I suggest the analogy is best suited for explaining structural aspects of macromolecules, and ill-suited when applied to whole cells. I then proceed to offer an explication of the machine analogy, relying on previous work, wherein I suggested a view of machine-likeness as tied to a system's degree of division of causal labor (a notion I label 'casual order'). This, in turn, is closely associated with the potential for providing decompositional explanations (Levy, 2014).

I use this understanding of machine-likeness-as-order to address the criticisms outlined above. I will argue that advocates of the machine analogy should not be too worried about (1) and (3) since indeterminism and reliance on thermal energy are fully consistent with the system in question exhibiting a division of labor. Criticism (2), however, poses a potential challenge for the analogy, inasmuch as it threatens the identification of stable functional roles, an essential aspect of decompositional explanation. Meanwhile, criticism (4) is relevant primarily for developmental questions (broadly construed), a context in which machine analogies have less a priori plausibility. I illustrate these claims by looking at recent work on molecular motors on the one hand, and reaction-diffusion models of pattern formation on the other hand.

Lecture 4 | *Can Bayesian models in cognitive neuroscience show that we are rational?*

Summary

The Bayesian approach plays a central role in present day cognitive neuroscience. It has been used to model a variety of mental capacities, from early perception through explicit, effortful reasoning. A current textbook presentation says that "according to [Bayesian] models, the human mind behaves like a capable data scientist (or crime scene investigator, or diagnosing physician...) when dealing with noisy and ambiguous data." (Ma, Kording and Goldreich in press, 15). Given this vivid description and given that many philosophers view Bayesian inference as a pillar of rationality, especially in contexts involving "noisy and ambiguous data", it would seem that epistemology and science may be converging on a similar message. Or to put the matter more bluntly: cognitive science appears to show that we are (epistemically) rational.

But appearances are misleading; or so I will argue. Bayesian cognitive neuroscience science does not tell in favor of the idea that we are Bayesian-rational. Indeed, I will make a somewhat stronger claim: Bayesian models, in anything like their present form, cannot show such a thing. My key argument runs as follows: Bayesian modelers, in most contexts, assume that the mind doesn't carry out full-on Bayesian computations. This is both for theoretical considerations – representing and calculating the terms of Bayes formula is overly taxing, computationally speaking – and for empirical reasons. Instead, modelers typically posit algorithms that *approximate* such computations. But this, even under the assumption that such models succeed admirably, is a far cry from showing that the brain "behaves like a capable data scientist." In particular, approximation algorithms are consistent with substantial deviations from Bayesian rationality, including classic probabilistic biases.

After making this argument I will discuss two responses to this situation, suggested in recent cognitive neuroscience. The first – the idea that the mind can be viewed as approximating Bayesian rationality – embodies a simple but seductive mistake. The fact (if it is a fact) that the brain can be modeled *by* means of an *approximation* does not entail that the mind *approximates*. The second – a retreat to a view on which the brain is rational, given resource constraints and performance limitations – may well be cogent from a methodological standpoint. But read as an attempt to reconceive the relevant notion of epistemic rationality, it appears hasty and undermotivated.

Supporting Info

Venue

University of Zagreb, **Faculty of Philosophy and Religious Studies**

Jordanovac 110

HR-10000 Zagreb, Croatia

<https://www.ffrz.unizg.hr/en/>

Hall: **p. Peter-Hans Kolvenbach SJ** (122 seats)

| Entrance: free, no registration, no fee

| Note: Free parking space available at site

Getting to the Venue from a rally point (for lecturers and high guests)

| *Need to know (!)*

EUPhilBio_2022 crew will meet you at the rally point at 08:45 h and accompany you to the Venue on Thursday and Friday

Rally point | Kaptol (Cathedral square): https://en.wikipedia.org/wiki/Kaptol,_Zagreb

Currency in Croatia

One can only pay in Croatian Kuna (HRK); euro (€) is not yet accepted as an official way of payment

Currency ranking <http://www.xe.com/currency/hrk-croatian-kuna>

Miscellaneous

| *Internet access*

Free Wi-Fi service available at premises

| *Early gatherings, breaks and late gatherings*

Coffee/Refreshment

Provided only for hosts, lecturers and high guests

Short pause

Limited supply of bottled water for all

Commercial coffee-machines available at site; audience is encouraged to bring their own source of water

Light lunch

Sandwich bar (provided only for hosts, lecturers, high guests and *EUPhilBio_2022* crew)

In general, special diet requests will be met if pre-announced; however, persons with special (i.e. medical) diet needs are encouraged to bring their own food if necessary

Short get-together in the open

Beverages & limited supply of bottled water for all; audience is encouraged to bring their own source of water

Gathering together over dinner

Open to all but, however, food and beverages (based on personal choice) are covered only for lecturers and high guests

Medvedgrad Brewery: <https://www.pivovara-medvedgrad.hr/ilica/?lang=en>

| *City of Zagreb*

In case you wanna discover the city <http://www.infozagreb.hr/&lang=en>

<https://www.zagreb.hr/en/the-mayor-of-zagreb/106869>

<https://en.wikipedia.org/wiki/Zagreb>

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