

# THE SACRED COMPUTER INSTITUTE'S THEORY OF UNIVERSE AND MIND

<https://github.com/Twenkid/Theory-of-Universe-and-Mind/>

<https://artificial-mind.blogspot.com/2011/12/embodiment-is-just-coordinate-spaces.html?m=0>

In by [Todor "Tosh" Arnaudov - Twenkid](#) // Friday, December 09, 2011 // [Leave a Comment](#)

## Embodiment is just coordinate spaces, interactivity and modalities - not a mystery

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"The debate" - should an AGI be embodied or not. I participated in a discussion on sensorimotor hierarchies a few months ago in the AGI list, but I'm lazy to digest it here right now (yet). I'll reword one POV of the essence which I thought of recently, though. "Body" and "embodiment" is actually about:

- **Known fixed basic continuous coordinate spaces** - that simplifies search and basic operations and sets one of the basic components of the inputs and their initial "labels" - coordinates. The simplest use of this is that mind can recognize where the activity is and relate coordinates of inputs to each other.
- **Interactivity** - input and output, includes changes of coordinates as smooth as possible in time-space - allows for as general as possible inputs and outputs (actions).
- **Modalities** - it's about dealing with different types of lowest level (for the system's sensors) input from the environment, with the "physics" - for constructive reasons and more general input. Each system should eventually deal with some kind of lowest level input and output, the more general it is, the more general intelligence would be.
- **Inter-modalities** - to relate and find models between them.

- **Value-free initial inputs** - initially sensory inputs and motor outputs don't have meanings, except when related to:

- **Basic reward-system** - that's in order to keep system's integrity in the "physical" world where it exists and to avoid self-destruction.

\* First published in the blog "**Artificial Mind**", a.k.a. "**Todor Arnaudov's Researches**", a branch of "**The Sacred Computer**"

Notes from the book "The Prophets of the Thinking Machines: AGI & Transhumanism: History, Theory and Pioneers" (originally in Bulgarian):

- **Known fixed\* basic continuous coordinate spaces ...**

Fixed as permanent, persistent, stable "enough". A frame of reference as in John Hawkins view. A root for grounding.

Note that "continues" in mind, as in Theory of Universe in Mind, is rather in the sense of being **connected, linked** and not as continuous smooth function in maths.

... - **input and output** – sensory and motor

- **Modalities ...** – different kinds of sensory domains such as auditory, visual, tactile, temperature, smell etc.]; also different kinds motor (output) domains, like with the generative models: physical motion/coordinates, sound, image etc. In TOUM the most basic causation is writing data from the memory of one causality-control unit to another one. Respectively the basic sensory action is reading or receiving data.

- **Value-free [of affectional valence, emotional] initial inputs** - ...

These are the raw data which have to be predicted, modeled, generated and the success is in improving the prediction. See the two kinds of "rewards": cognitive (this one) and "physical" (sensual, emotional), linked to the basic reward system required for survival in some "real" world.

**„embodiment is not a mystery“...** – in the *functional* point of view, which is

described above, thus the necessity of the listed features in order to create a complete thinking machine and a universal mind. I didn't implied spiritual or transcendent sense, subjective experience etc. In my opinion in these other senses the embodiment and consciousness are yet a "mystery".

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<https://web.archive.org/web/20120813071503/https://artificial-mind.blogspot.com/2011/12/embodiment-is-just-coordinate-spaces.html>

Compare with Jeff Hawkins's generalizations in his new book „*Thousand brains theory*“, where the coordinate space is called “*reference frame*”.

Jeff Hawkins, “A Thousand Brains Theory”, ~3.2021

<https://www.amazon.com/Thousand-Brains-New-Theory-Intelligence/dp/1541675819>

Compare also with the line of research of Michael Levin, Chris Fields etc. for diverse embodiments, such as the following 2022 paper:

Concept Paper

**Competency in Navigating Arbitrary Spaces as an Invariant for Analyzing Cognition in Diverse Embodiments**, Chris Fields 1,2 and Michael Levin

2,3,\* , 7.2022

<https://chrisfieldsresearch.com/spaces-entropy-pub.pdf>

See also the works from the classical TOUM.

See also the strategic essay “*How would I invest a million with the greatest benefit for the development of the country*”, ~6/2003 where I suggest that mind is supposed to process the data with the same algorithm.

*"The form of thought is different in different manifestations of thinking, but its essence, the underlying mechanisms, are the same, and what changes is only the data with which it works: text, sound, images, sequences of images, abstract concepts etc."*

<https://www.oocities.org/todprog/ease/proekt.htm>

[https://artificial--mind-blogspot-com.translate.goog/2020/07/interdisciplinary-research-institute.html?\\_x\\_tr\\_sl=auto&\\_x\\_tr\\_tl=en&\\_x\\_tr\\_hl=bg](https://artificial--mind-blogspot-com.translate.goog/2020/07/interdisciplinary-research-institute.html?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=bg)

Also:

\* The multimodality is the direction towards the generative models develop – text-to-sound, text-to-image, text-to-video, multipurpose multimodal models such as “GATO” by Google DeepMind etc.

The translation in the Bulgarian book:

## **Телесността е просто координатни пространства, взаимодействие и модалности – а не тайнство**

Тодор Арнаудов, петък, 9.12.2011

Относно „дебатите“ дали мислеща машина с УИР трябва да има тяло или не... Преди няколко месеца участвах в обсъждане за сетивно-моторните йерархии в пощенския списък по УИР, но не мога да събера всичко сега, само ще обобща най-същественото, за което мислих наскоро (...) „Тялото“ и „телесността“ всъщност се отнасят до:

\* **Известни неизменни<sup>1</sup> първични непрекъснати координатни пространства** – това опростява търсенето и първичните действия и установява един от основните съставни части на входните данни и техните начални имена – координатите. Най-простата употреба е, че умът може да разпознае къде се случва дадено действие и да свърже координатите на входните данни един с друг.

\* **Взаимодействие** – входът и изходът [сетивно и двигателно], включва промени на координатите възможно най-плавно във времето и пространството – позволява възможно най-общ вход и изход (действия).

\* **Модалности** – [различни видове сетивност като слух, зрение, осезание, топлина, мирис и пр.] – отнася се до възможността за работа с различни видове данни от средата на най-ниско ниво (спрямо датчиците на системата), с „физиката“. Необходими са различни видове по конструктивни причини и така се доставят по-всеобщи сетивни данни. Всяка система би трябвало в крайна сметка да обработва някакъв вид данни от най-ниско ниво, и колкото по-общ, толкова по-всеобщ ще бъде разумът на тази система.

\* **Междумодалности** - способност да свързва, съотнася и да намира

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1 Fixed: “Known fixed basic continuous coordinate spaces (...)”

взаимозависимости, закономерности, модели между тях.

\* **Начални сетивни данни без [чувствени] оценъчни определения** - началните сетивни данни и изходни, двигателни действия, нямат други значения, освен свърсани с:

\* **Първична награждаваща система** – тя е необходима, с цел запазване на целостта на системата във „физическия“ свят, онзи, в който тя съществува, и предпазване от самоунищожение.

## Бележки

„**А не тайнство**“... – телесността е такава от *функционална* гледна точка, която е описаната по-горе, и от там необходимостта на тези особености за създаване на пълноценна мислеща машина и универсален разум. Не пишех от метафизично или отвъдно духовно гледище, субективно усещане и пр. В този друг смисъл според мен телесността и съзнанието все още си остават „тайнство“.

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Сравни с обобщенията на Джеф Хокинс в новата му книга „*Теория за хилядата мозъка*“, които по същество са същите, но там координатната система се нарича „отправна система“ (reference frame).

Jeff Hawkins, “A Thousand Brains Theory”, ~3.2021  
<https://www.amazon.com/Thousand-Brains-New-Theory-Intelligence/dp/1541675819>

\* Мултимодалността е и насоката към която се развиват пораждащите модели – текст-звук, текст-изображения, текст-видео, многоцелевия модел „GATO“ на DeepMind и пр.

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