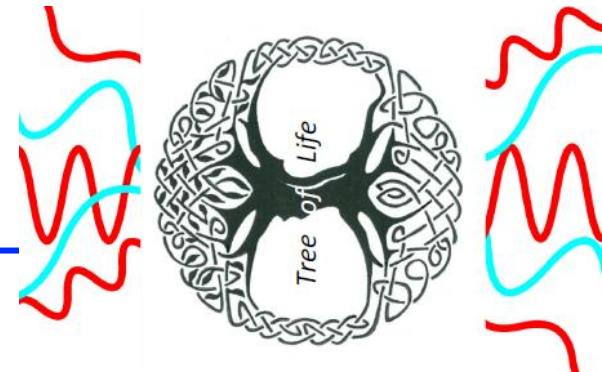

AS-74.4192 Elementary Cybernetics

Final Lecture: Mental Vitalism



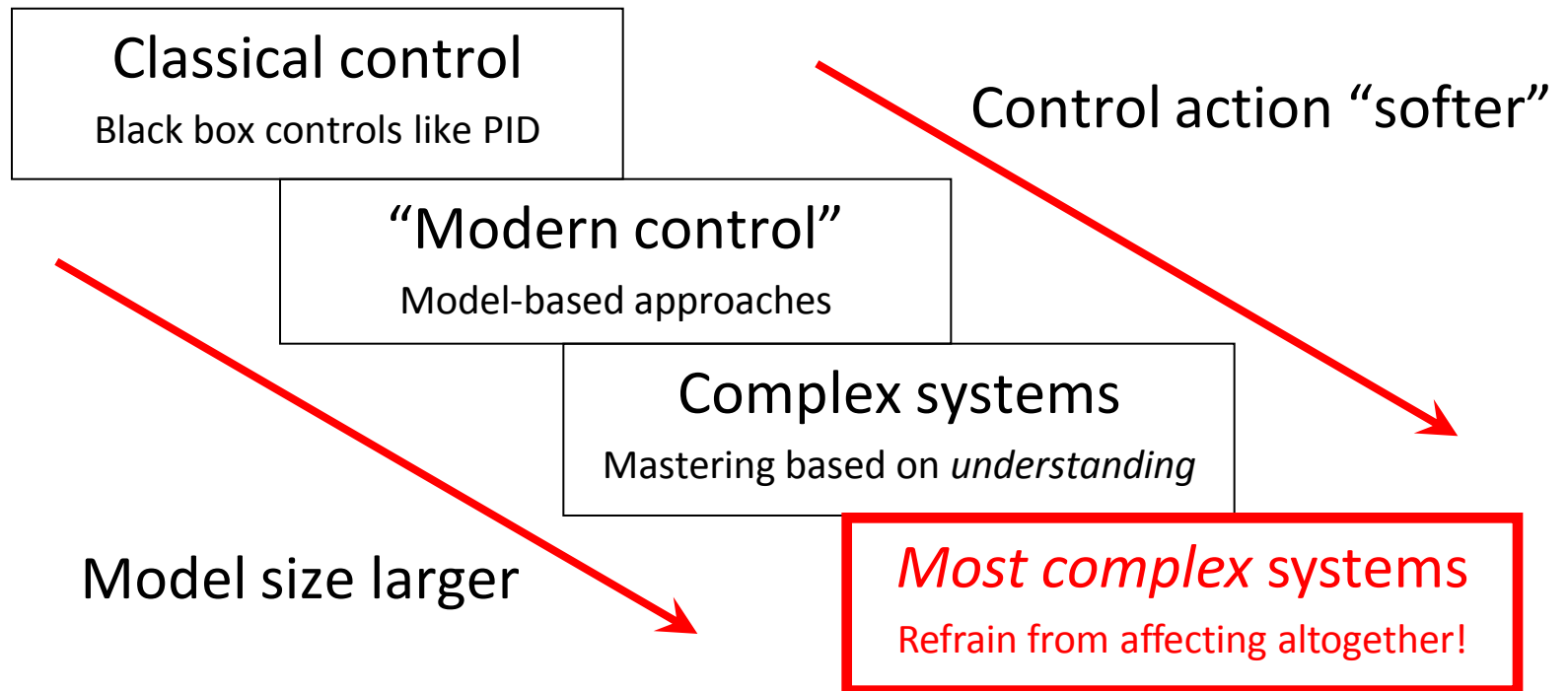
Last slide added: *a look back*

- There are connections, random to start with, getting bound to a whole, seen in retrospect
- Without the work of professor *Esa Saarinen*, I would perhaps not have thought that this kind of approaches are possible at TKK
- One could say that what Esa does, is “applied enformation theory”
- On the other hand, this course is “applied flourishment theory”, as studied by Esa – indeed, the whole course is an application of it
 - If Petri were not Esa’s student, he would perhaps not have taken a chance, and this course would have ended years ago
 - Now, however, the course was constantly evolving ...
 - When the course is now dying it turns out *it was living*, and there still are the *standing waves* ...



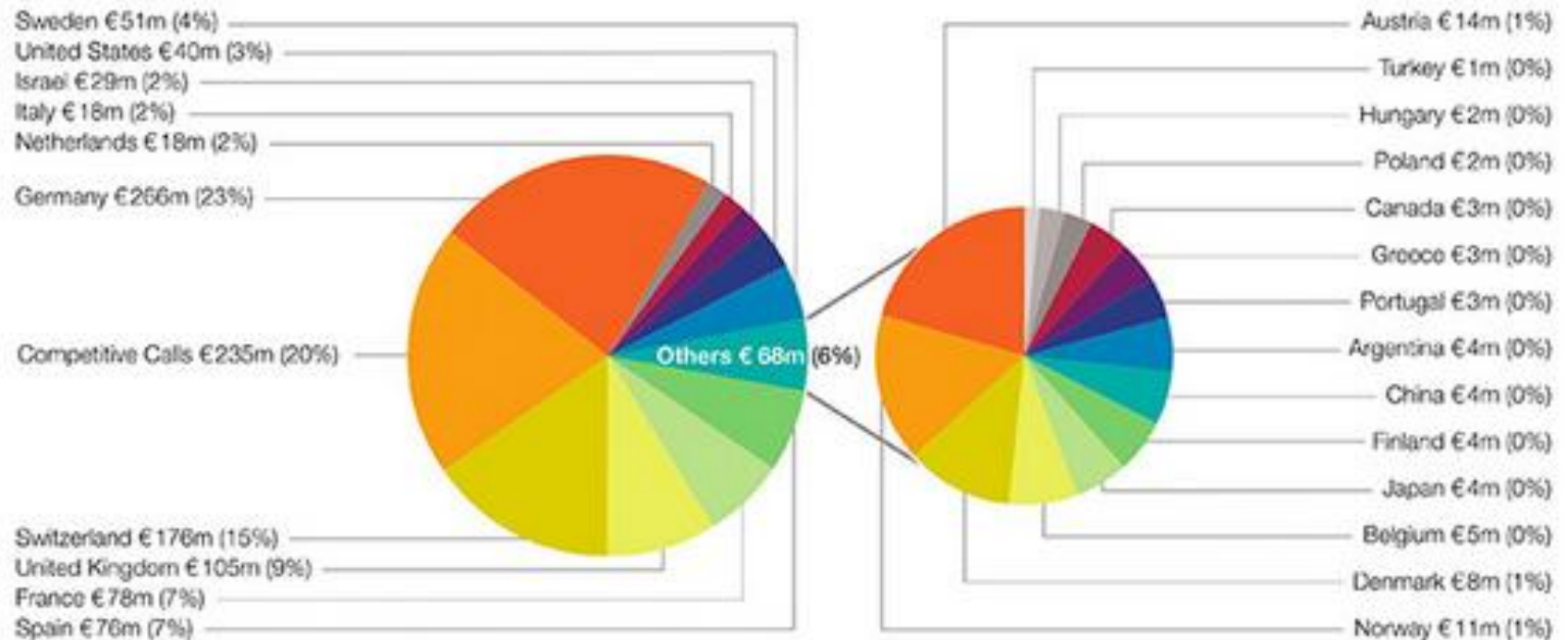
Wrapping up: *The final last lecture of the course*

- In retrospect ... view from Control Engineering to Systems Engineering, and *beyond*
- Cybernetics – the key idea is feedback and control ... however ...



Facing the most complex of systems: Background

- HBP (human brain project): 1 billion euros to simulate neurons to extreme precision, and to “solve the mystery of consciousness” (?)
- Big Science: No philosophies are needed any more, just *power*!?



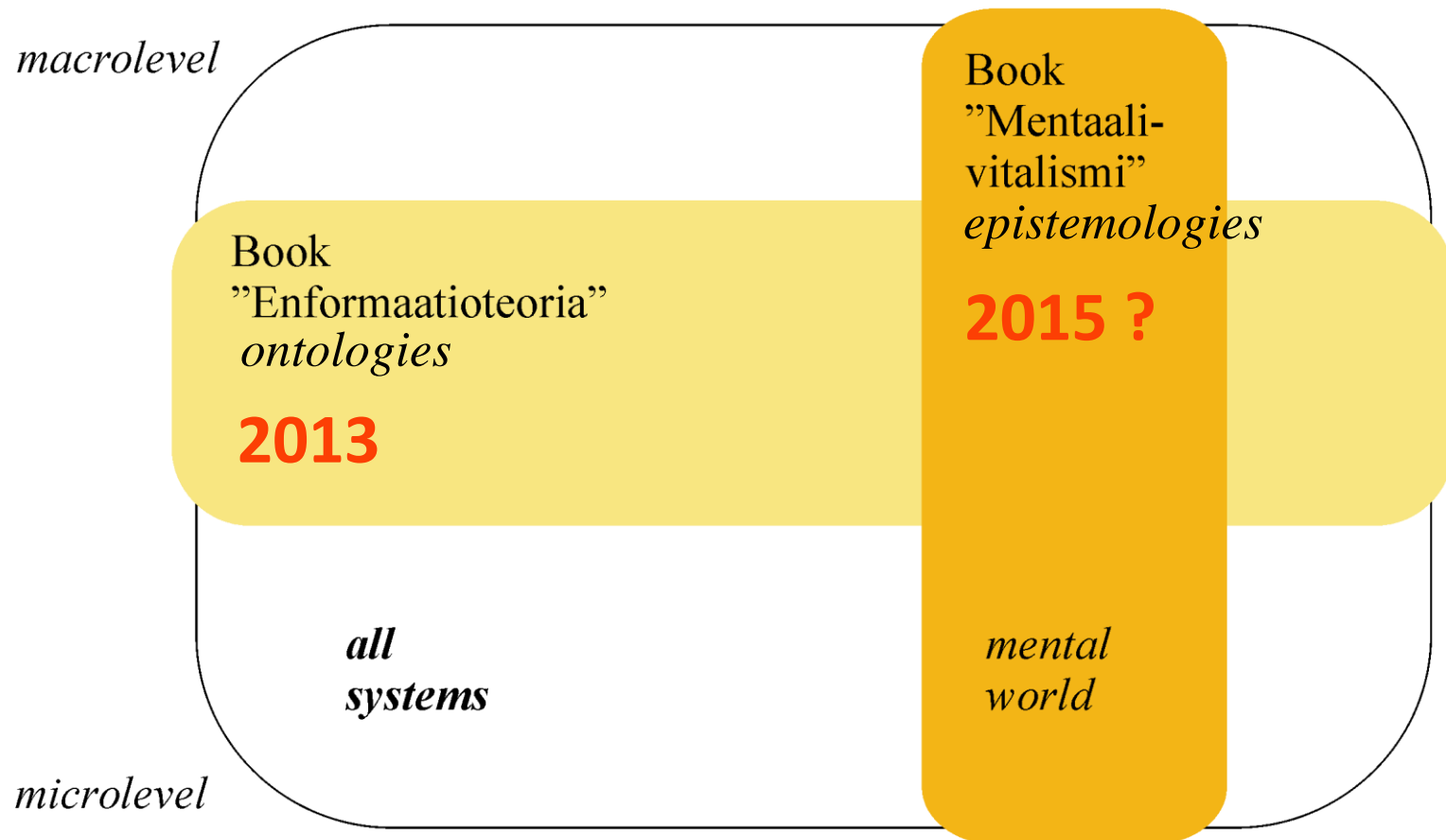
There is hope

A decorative gold frame with intricate carvings and a textured surface. Inside the frame, on a light gray background, is the text: "When the world becomes exceedingly complicated, the *DUAL VIEW* becomes simpler." The words "DUAL VIEW" are in red and italicized, while the rest of the text is in black.

When the world becomes
exceedingly complicated,
the *DUAL VIEW* becomes
simpler.

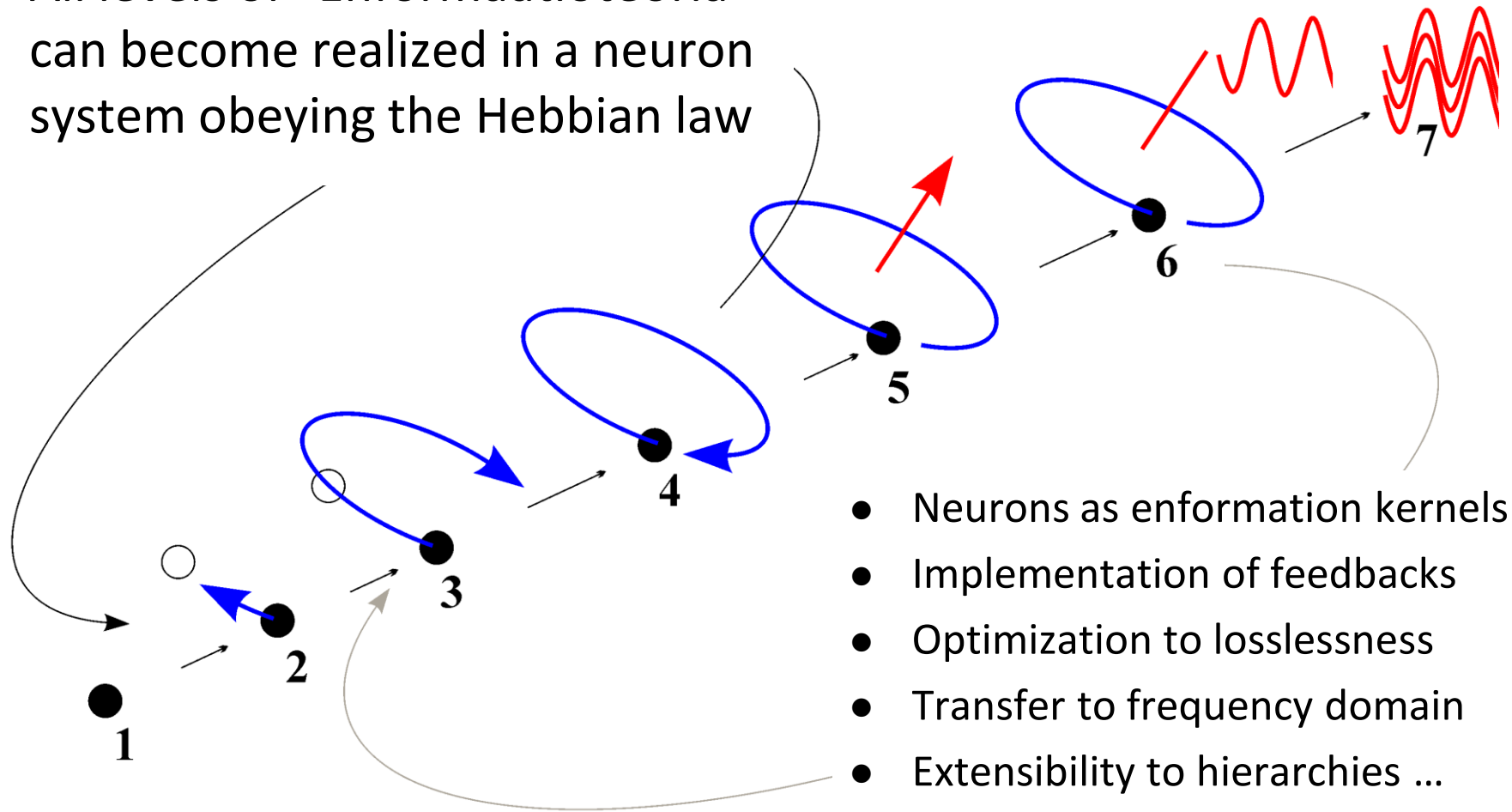


Not everything was said last time



Brain implements it all

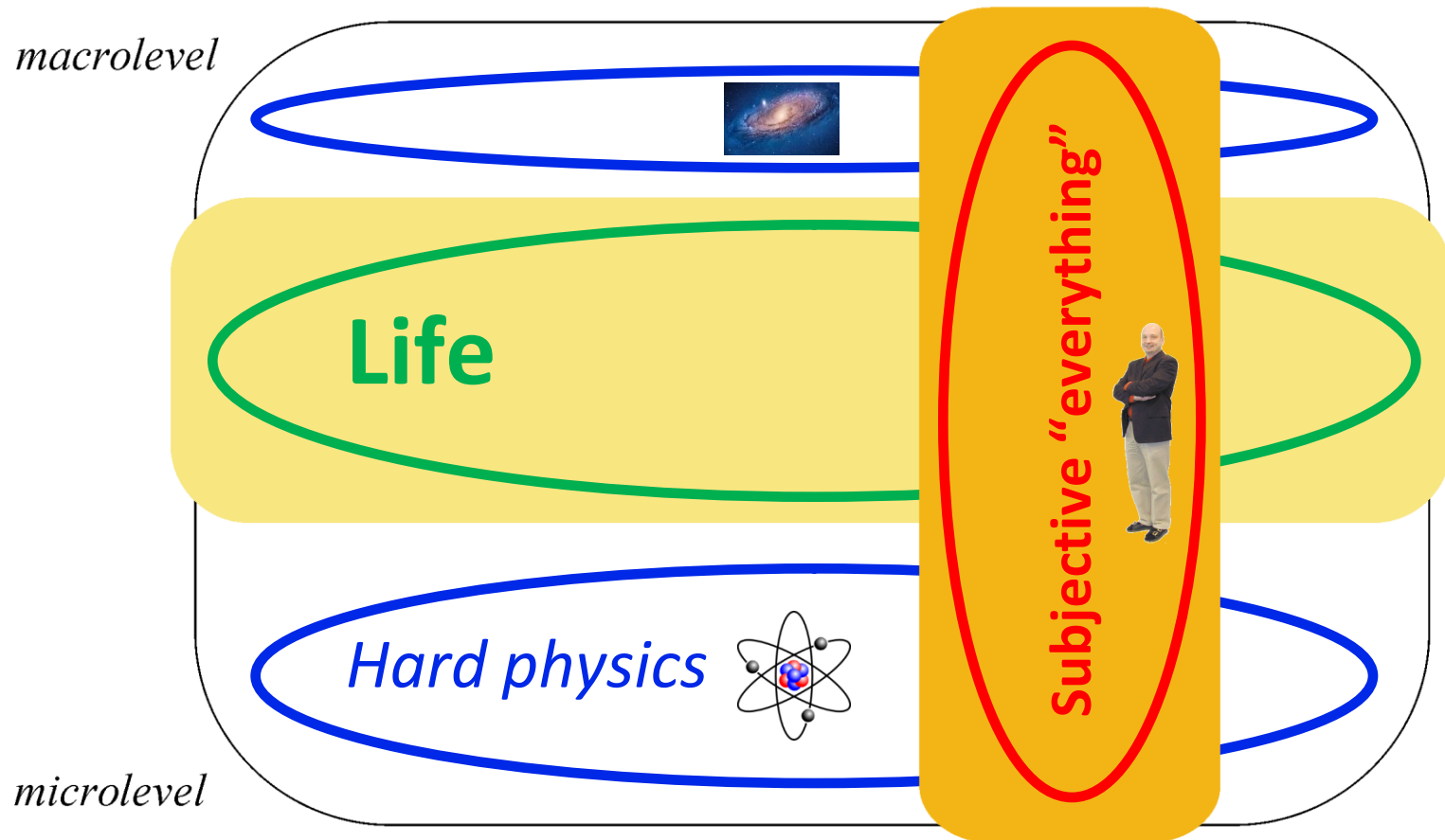
- All levels of “Enformaatioteoria” can become realized in a neuron system obeying the Hebbian law



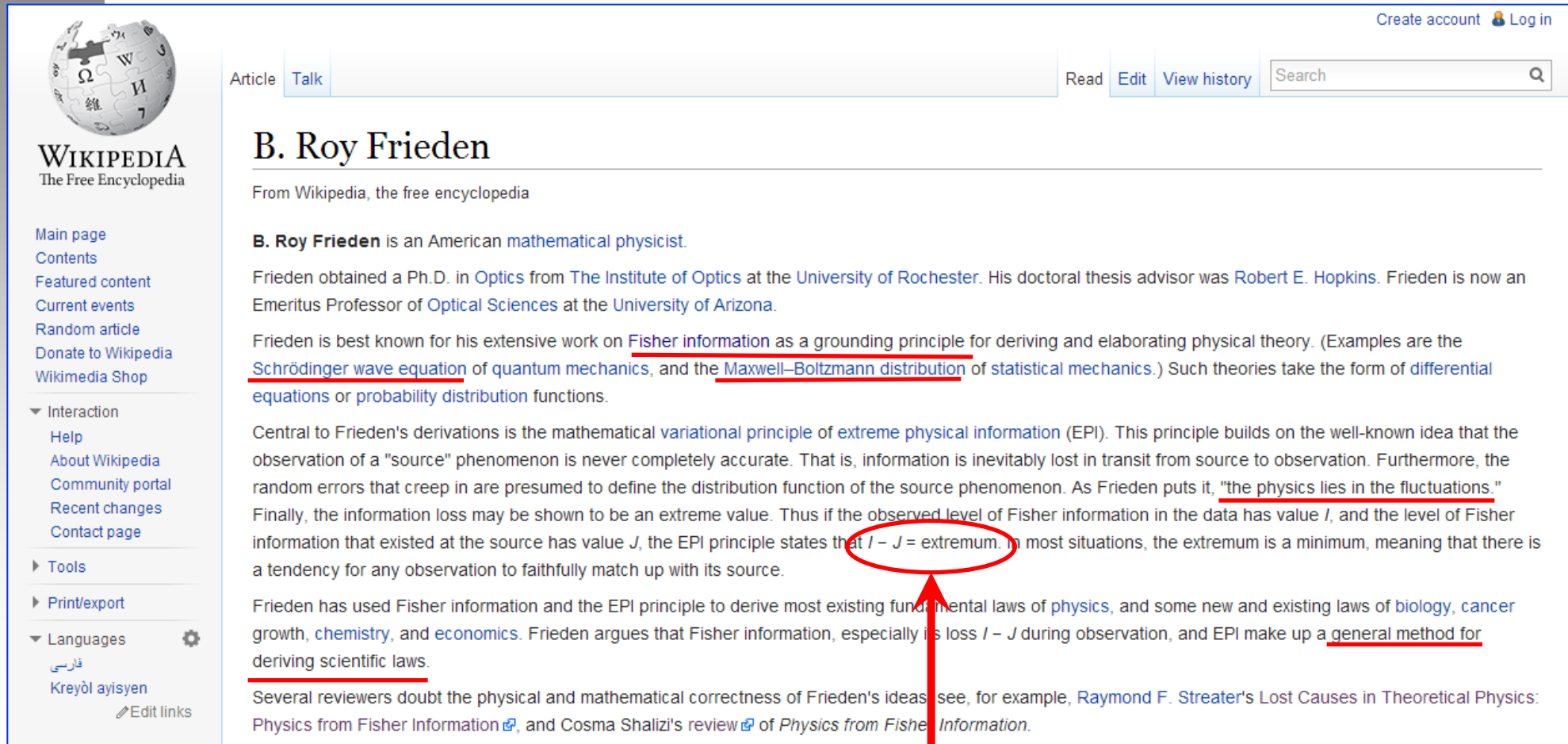
- Neurons as enformation kernels
- Implementation of feedbacks
- Optimization to losslessness
- Transfer to frequency domain
- Extensibility to hierarchies ...



Life, Universe, and Everything



... One slide about that “Universe” thing ...



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B. Roy Frieden

From Wikipedia, the free encyclopedia

B. Roy Frieden is an American [mathematical physicist](#).

Frieden obtained a Ph.D. in [Optics](#) from [The Institute of Optics](#) at the [University of Rochester](#). His doctoral thesis advisor was [Robert E. Hopkins](#). Frieden is now an Emeritus Professor of [Optical Sciences](#) at the [University of Arizona](#).

Frieden is best known for his extensive work on [Fisher information](#) as a grounding principle for deriving and elaborating physical theory. (Examples are the [Schrödinger wave equation](#) of quantum mechanics, and the [Maxwell–Boltzmann distribution](#) of statistical mechanics.) Such theories take the form of [differential equations](#) or [probability distribution functions](#).

Central to Frieden's derivations is the mathematical [variational principle](#) of [extreme physical information](#) (EPI). This principle builds on the well-known idea that the observation of a "source" phenomenon is never completely accurate. That is, information is inevitably lost in transit from source to observation. Furthermore, the random errors that creep in are presumed to define the distribution function of the source phenomenon. As Frieden puts it, "the physics lies in the fluctuations." Finally, the information loss may be shown to be an extreme value. Thus if the observed level of Fisher information in the data has value *I*, and the level of Fisher information that existed at the source has value *J*, the EPI principle states that *I - J = extremum*. In most situations, the extremum is a minimum, meaning that there is a tendency for any observation to faithfully match up with its source.

Frieden has used Fisher information and the EPI principle to derive most existing fundamental laws of [physics](#), and some new and existing laws of [biology](#), [cancer growth](#), [chemistry](#), and [economics](#). Frieden argues that Fisher information, especially its loss *I - J* during observation, and EPI make up a general method for deriving scientific laws.

Several reviewers doubt the physical and mathematical correctness of Frieden's ideas; see, for example, [Raymond F. Streater's](#) *Lost Causes in Theoretical Physics: Physics from Fisher Information*, and [Cosma Shalizi's](#) review of *Physics from Fisher Information*.

- Remember that now we have

$$J(x) = \frac{1}{2} x^T \mathcal{E} \{ \bar{x} \bar{x}^T \} x - x^T \mathcal{E} \{ \bar{x} u^T \} u.$$



Hands on – diverse guidelines employed

- Engineering-like approaches applied to the modeling of *thinking*
 - **Approaches.** Observe the biases – there are neglected ideas, that have traditionally been ignored. But perhaps the times have changed, and new methodologies may have made the objections obsolete. Challenge the authorities!
 - **System scope.** First, observe that to filter noise in data, one has to include thoughts of *all people at all times*. Without the society, an individual would never learn to use language, and it is more like “society speaking in us”.
 - **Nonidealities.** Beauty resides in details; it is important to choose these details appropriately. For example, there are no pure information flows but there always is loss and there is delay; these introduce characteristic dynamics in systems.
 - **“Births”.** Nature seems to reuse its ideas; these ideas are in their simplest form when there are only a few contributing variables. When the simple principles cumulate, the resulting complexity seems to have a fractal structure.
 - **Common sense.** Do not forget engineering-like intuition and curiosity. Optimizing systems would like to stay still (who wouldn’t?); why are they still evolving, or living and dissipating? Where do they get the necessary power, in concrete terms?



Birth of a world view – first observation: *I think*

- **I think, therefore I exist.** There is the *subject* vs. *objects*, resulting in Cartesian dualism – and when the hard part is ignored (!), one concentrates *solely on the external world objects*. – *By now, this view has already been extensively exploited – and exhausted?*
- I think that – alternative reasonings exist, too:
 - **I think, therefore *I really am*.** The hard part, or the real kernel of the observation should be given true emphasis, resulting in **subjectivism**. →
 - **I think, therefore *I am contrasting myself against what I am thinking at*.** One cannot think based on a truly empty *tabula rasa*; this gives **dialectics**. →
 - **I think, therefore *something is flowing*.** What is the essence in the process of thinking – concentrating on this issue, results in **vitalism**. →
 - **I think, therefore “I” does *not yet truly exist*.** The key point is that *mind cannot be characterized in terms of formal manipulation of symbols!*



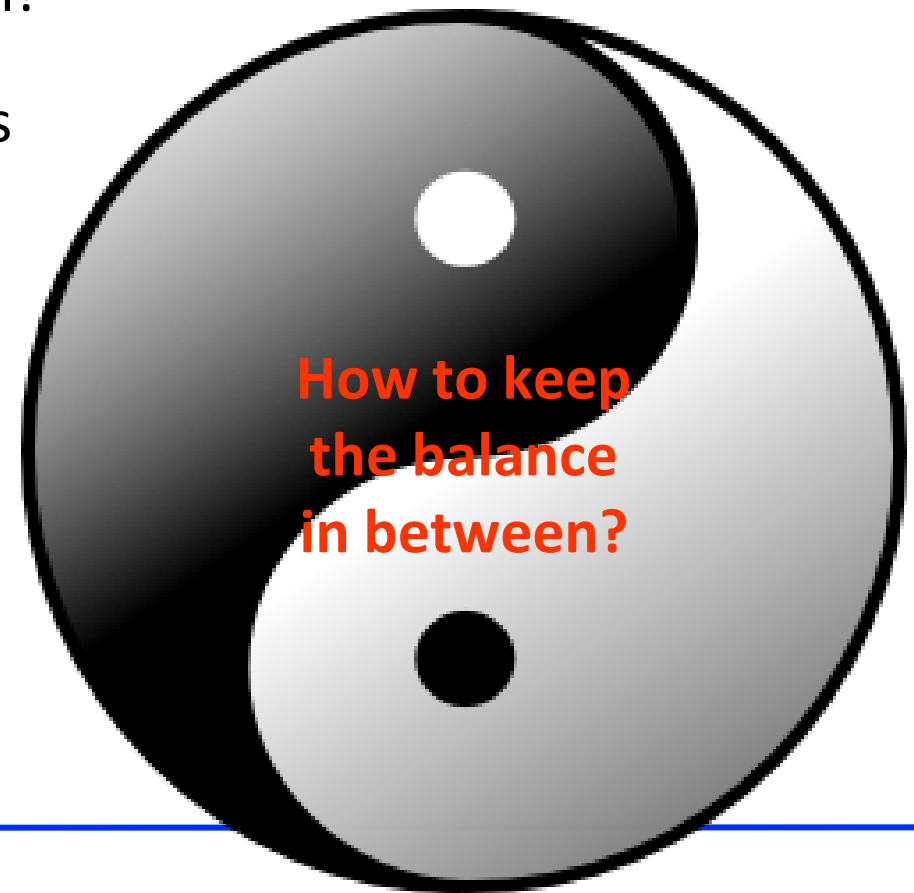
1. Subjectivism

- *The mind is more essential than the world*
- Esko Valtaoja in "Kaiken käsikirja" ("Handbook of Everything") says that *solipsism* is fruitless – but is it necessarily so?
- Let us try anyway – Archimedes once said that *you only need one fixed point to lift the world off its foundation.*



2. Dialectics

- Old history including (in the West) Socrates and Hegel
- ... But also Marxist materialism!
- Popper: “Dialectics contradicts two-valued logic” – *banned!*?
- *But now we have new tools* (multivariate statistics, etc.)



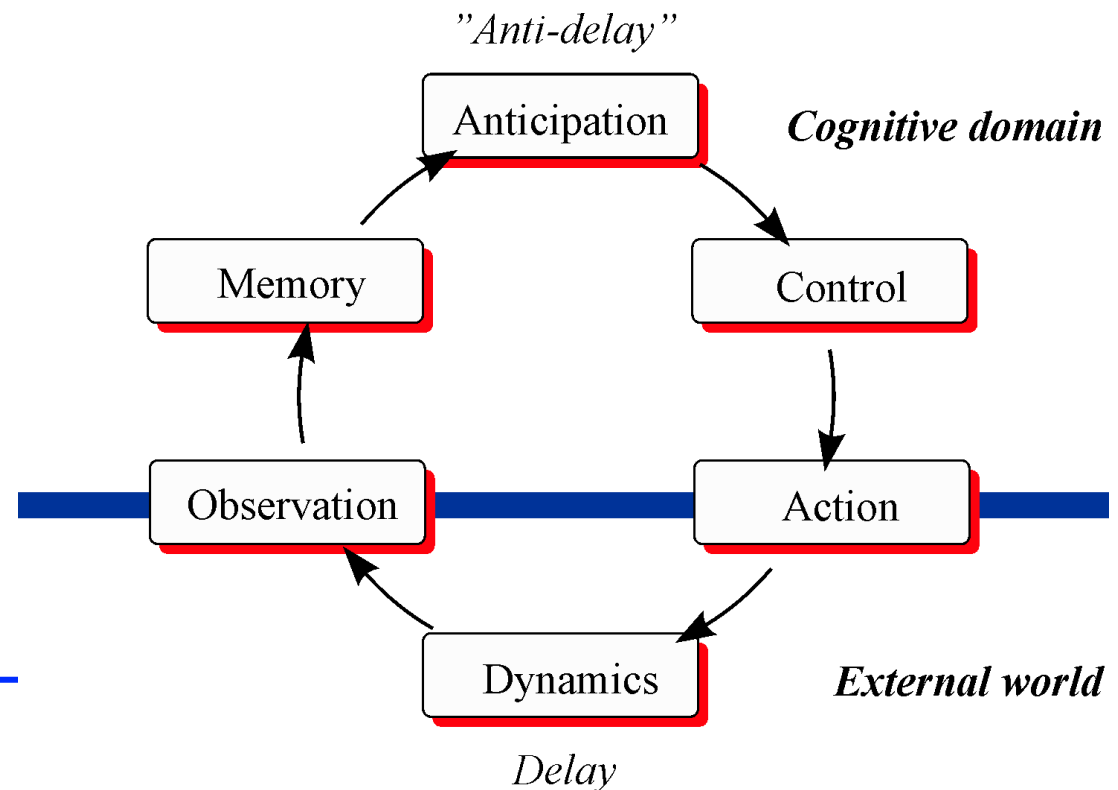
3. Vitalism

- Again, vitalism has long history, but today it seems to be *forbidden*
- However, the dialectic dynamic balances necessitate *tensions*
- It seems that *the “tension pairs” are the key to emerging models*
- Generally, it seems that Thesis always gives rise to some Antithesis
- The non-metric space becomes “mapped”
- There is an *axis* spanned by the opposites
- It is as simple as that – vitalism, or assumption of underlying movement need not mean introduction of some *teleology* or *finalism*
- ... *And again, now we have new tools*



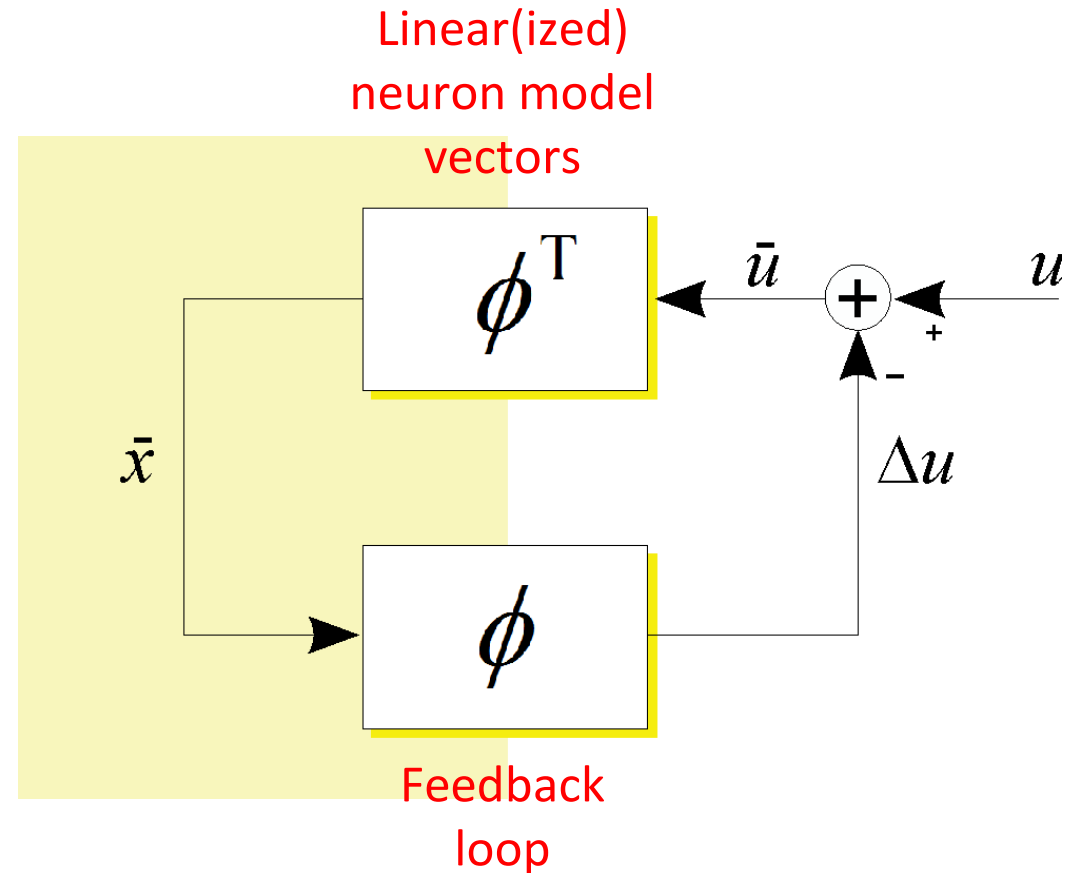
”Joka härillä kyntää” – controls seen everywhere

- *Control theory/engineering is the basis for everything* – the brain is essentially a *control device* – **it keeps up the dynamic balances**
- *Perceptual control theory (PCT) by William T. Powers claims that all cognitive functions can be characterized in terms of control*
- Personal observation:
Truly, the cognitive *learning curves* are typical behaviors of feedback controls

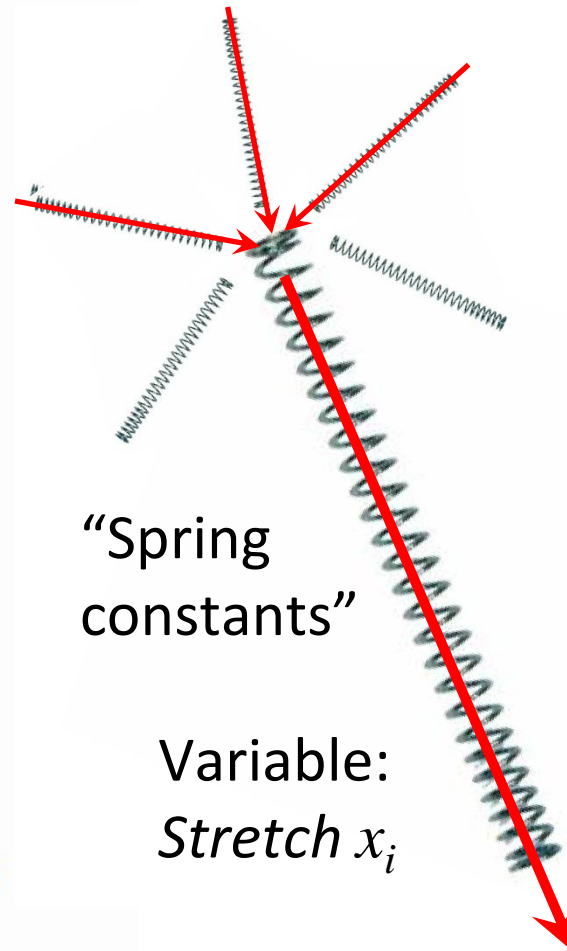
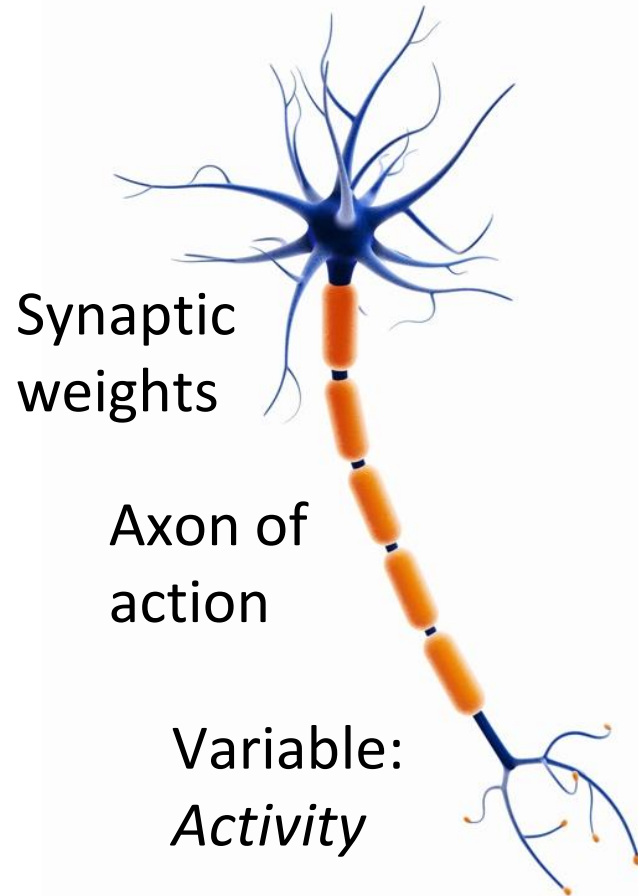


Where does control-like functioning emerge from?

- In real life, there are no pure information flows
- Exploitation results in exhaustion – there is negative feedback
- From outside, this looks like “buffering”
- Axes in space change to *strings* or *springs*
- Enformation theoretic adaptation: the springs become stiffer



Basic elements: Interpretation of neuron cells



- Reciprocity: effects are in both ways
- Fractality: same structure hierarchically repeated
- Dynamicity: Adaptation etc. *understandable only from this point of view!?*

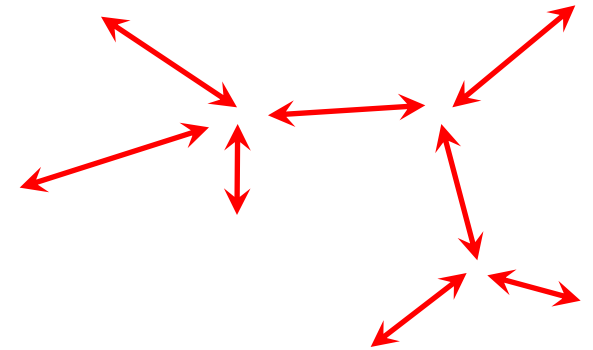
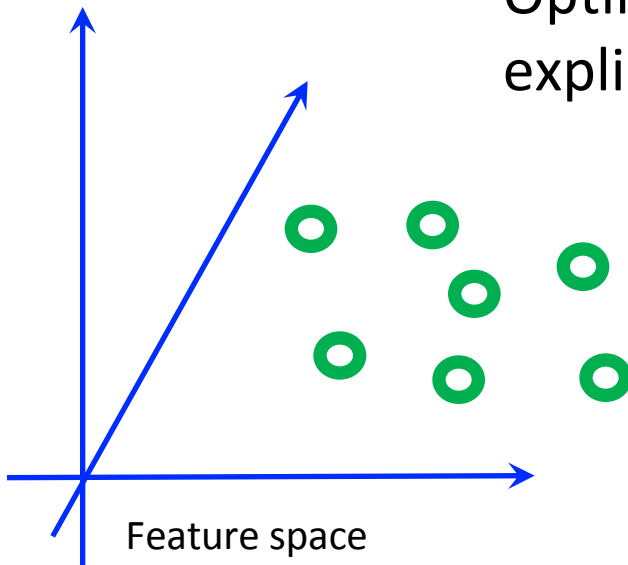


“Conceptual Spaces” vs. *Mental String Theory*

Basic elements:
coordinate points

Semantics (connections)
determined separately

Optimizations to be
explicitly tailored



Basic elements:
string vectors

Inherent topology
and metrics fixed

Automatic balance search
defining basic functioning



- Interconnection: Mathematical framework of *fuzzy subsets*
- Adaptation: Self-organization (equalization) of excitation



**This is just the
*primary view***

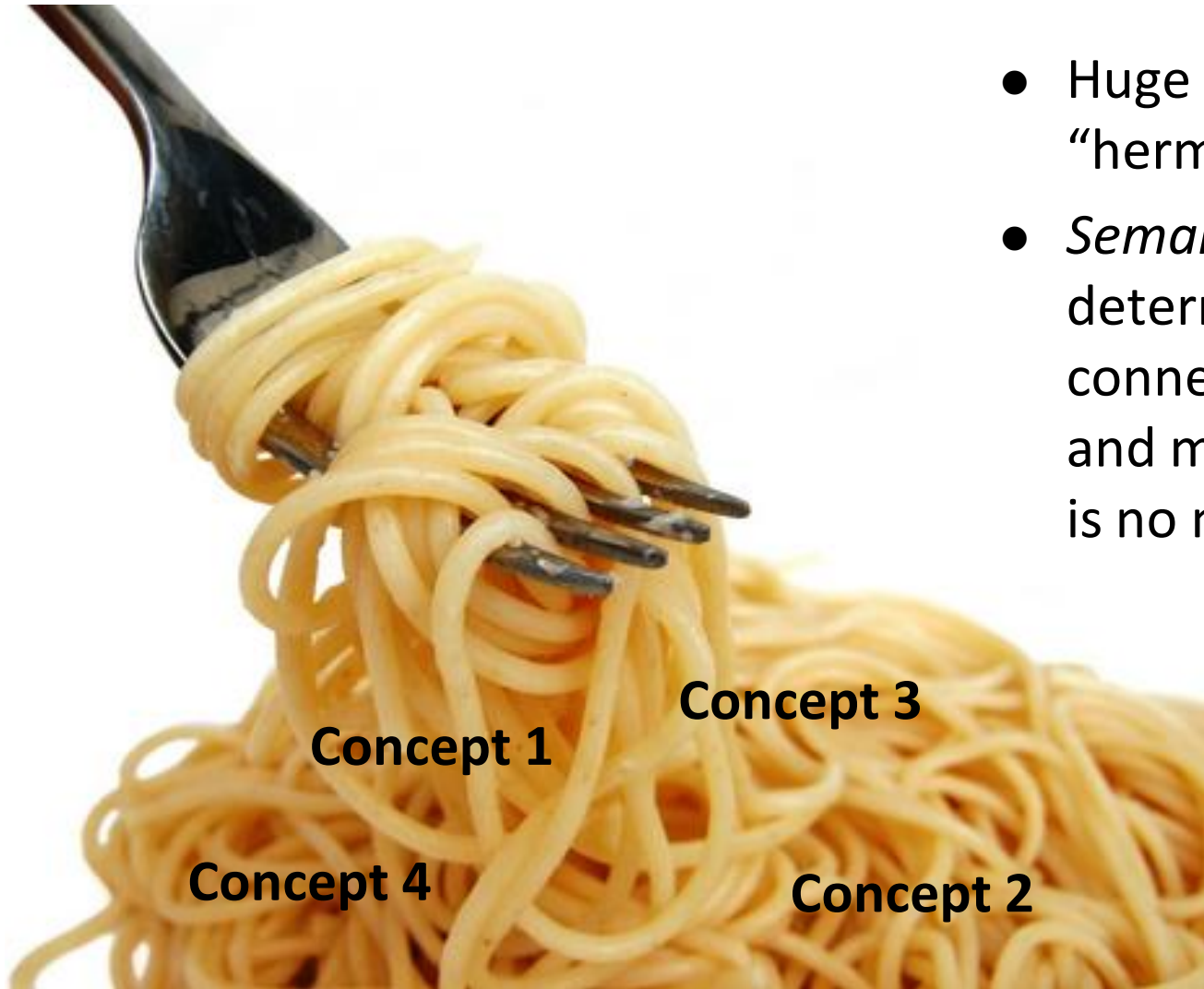


Primary approach: *View from inside the controls*

- When the controls become stiffer due to adaptation, the dynamic nature of the system finally vanishes – reducing to a *concept space*
- Illusion: All knowledge is static facts (Wittgenstein's *Tractatus*), all knowledge is based on invariances
- What makes things worse: Today's *analytical philosophy* is based on analysis of language ... further, all wisdom is in written form
- “What is not in the language form, that you cannot think about” – and language only captures clear-edged, unchanging conscious concepts



Today's knowledge: "Spaghetti Monster"



- Huge conglomerates of "hermeneutic cycles"
- *Semantics* to be explicitly determined through rigid connections, using more and more links until there is no more vagueness



Metaphor: “Mind is a computer”

- Actually, this is not so far-fetched: the role of a program is to model and simulate real life phenomena, as it is with the brain
- The pragmatic evolution has parallel direction in both cases: The systems have to work in a wide variety of complex environments
 1. First there were the old style “**spaghetti** codes” based on the structurally weak programming languages (Basic, Fortran)
 2. Then the program control became better “capsulated” in the object-oriented languages (Pascal, C)
 3. Now one speaks of *functions* or *agents*, where only the effects are visible, individual variables/parameters remaining hidden (Lisp, etc.) ... one can speak of *freedoms* ...



Challenge of *semantics*

- ... Something is still fundamentally wrong about such models: Explicitly defined “meaning” cannot escape Searle’s *Chinese Room*
- Mechanistic brain models will be forever “lost in translation”: *Mental model is meaningless without it carrying meaning*
- Can semantics be automated or is the human always needed as a middle-man to evaluate observations one by one?
- Let us define *natural (pragmatic–contextual Bateson–Berkeley) semantics as concrete “mental energy” stored in the springs*
- Concrete interpretation: Some mental structure is important if it contains energy to affect other structures and change the world
- In this sense, the mind/body dualism vanishes and it is no more a mystery why mental phenomena can affect physical objects



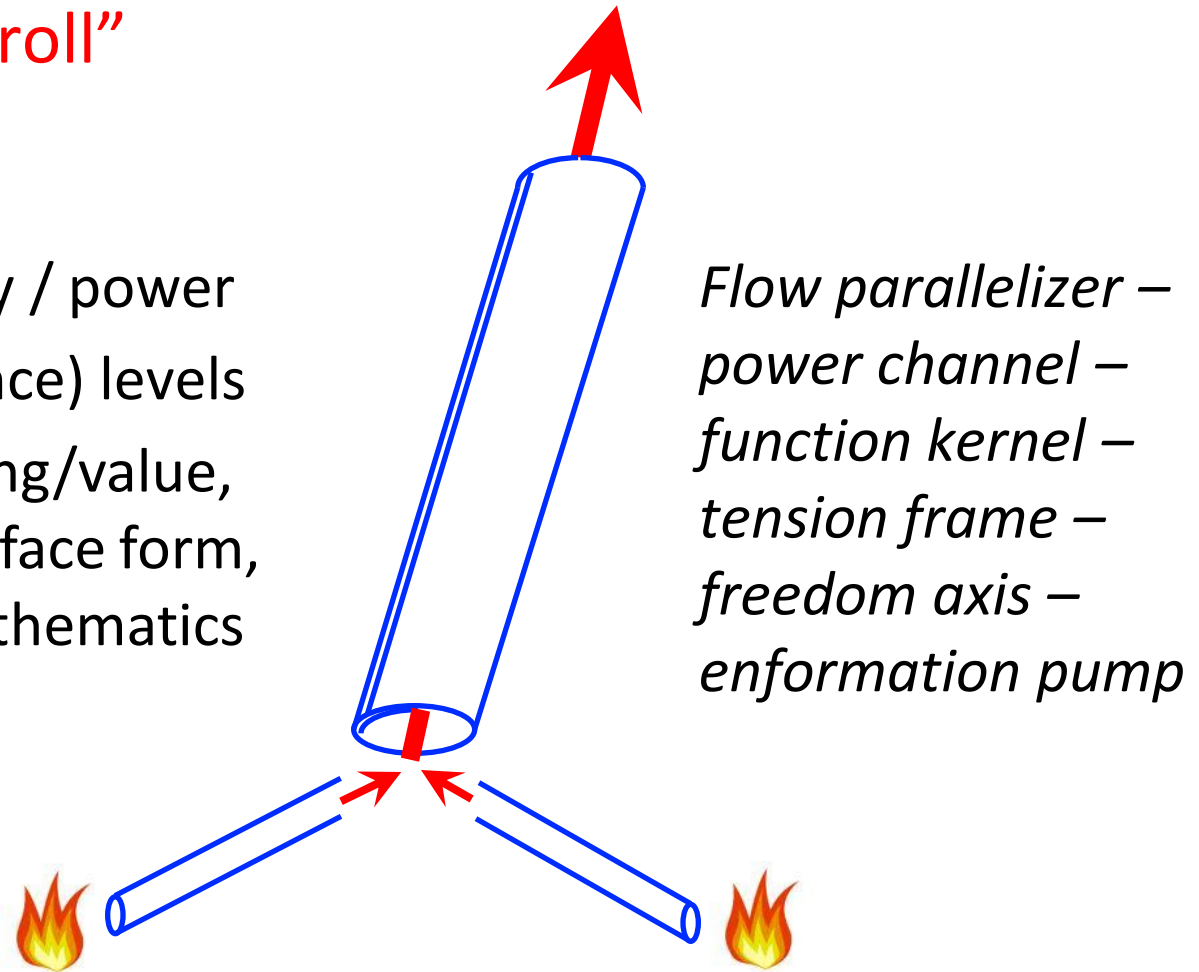
Dual approach: *View from above the controls*

- Rather than concentrating on static *constraints* and *invariances*, now the emphasis is on dynamic *freedoms* and *covariances*
- Variation (flow) directions in data (energy flow) can be captured applying PCA based methods – enformation theory does just that
- Not stretch or coordinates (or amplitude) of a spring, relative to x_i (three-dimensional vector) but *second powers*, relative to x_i^2 or $x^T x$ (summable scalar) are concentrated on – measurable quantities as physical energies, but invisible in static view.



Kernel of cognitive science: *Representation*

- **Tubulus** = “spring roll”
tubular neuron
- Tubes transfer energy / power
- Coupling of (emergence) levels
- Connection of meaning/value, data/observation/surface form, and mechanisms/mathematics



“Spaghetti Western” – “Spring Roll Eastern”

- *Dualisms* can be seen as extreme dialectics (with no continuity)
- It is no more about that Cartesian *mind* vs. *body* basic dichotomy!

Primary view

- Static info $x_i, E\{x_i\}$
- Structure, syntax
- Matter, content
- Intellect
- **Space**

Dual view

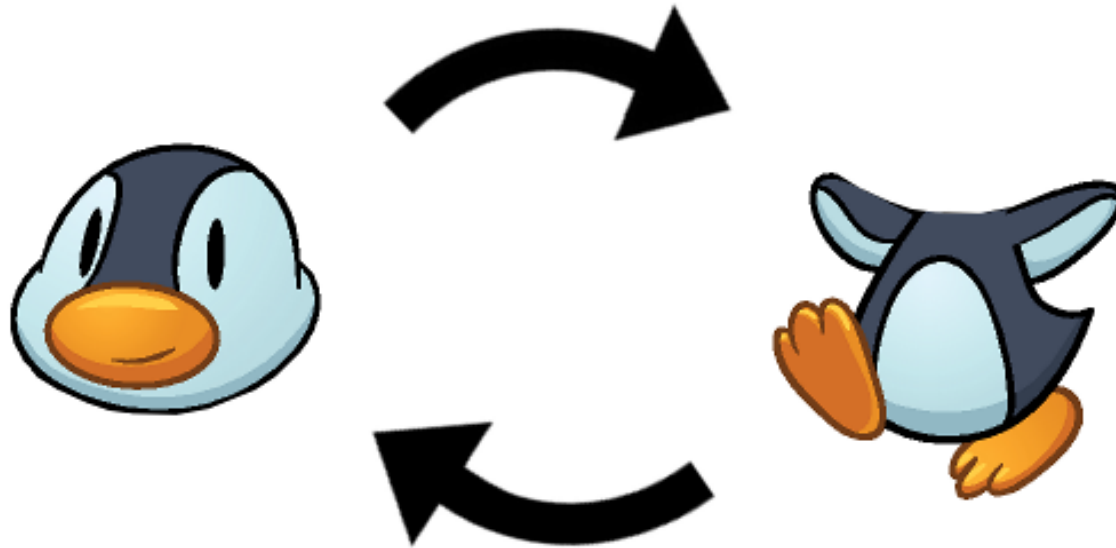
- Dynamic enfo $x_i^2, E\{x_i^2\}$
- Meaning (or “value” only)
- Life, *form through attractors*
- Instinct, intuition
- **Time**

past = memory = model =
cumulated subjective enfo



No psychophysical dilemmas

- There is no essential difference between mind and body
 - For example, nerves also measure hormone levels (?), giving *qualia* to *emotions*
 - On the other hand, immune system also implements pattern matching (?), etc.
- Information differs from matter only if it implements *function*



Entering the dual world

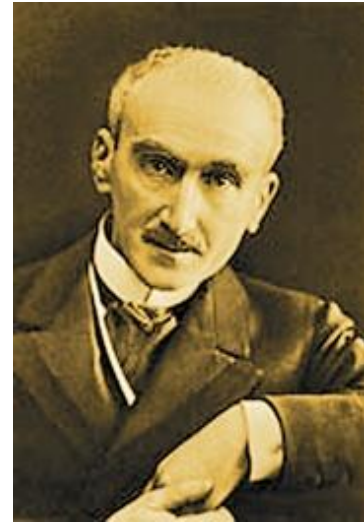
- Let us try to stay in the inverted world without breaking the spell



Connections

- **Old**

- Henri Bergson (1859 – 1941), Nobel Prize winner in *literature*. He divided mental processes between vitalistic instinct/intuition and more mechanistic intellect, claiming that immediate experience is more significant than scientific rationalism for understanding reality.



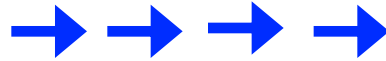
- **New**

- Daniel Kahneman (1934 –), Nobel Prize winner in *economics*. In his book *Thinking, Fast and Slow* (2011) he presents two modes of thinking: “System 1” is fast, instinctive and emotional, while “System 2” is slower, more deliberative, and more logical.



“Dualistic reasoning”

Traditional expertise



- Coupled information
- Programmed constructs
- Step-by-step inference
- Logics-based resolution
- Low-dimensional projections
- Novice-like rule firing
- Active effort needed
- Discrete thresholds
- Explicable, language-form

The opposite alternative



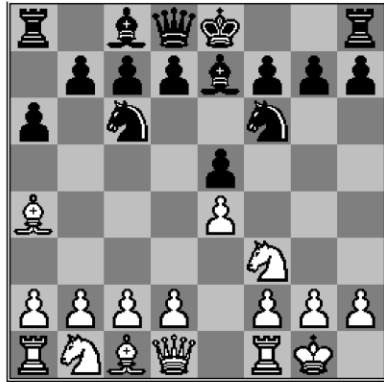
- Follow enformation
- Learned from data
- Parallel pattern matching
- Regression-based evaluation
- Holistic and high-dimensional
- Expert-like association
- Instinctive, effortless
- Weak signals combined
- “Silent knowledge”



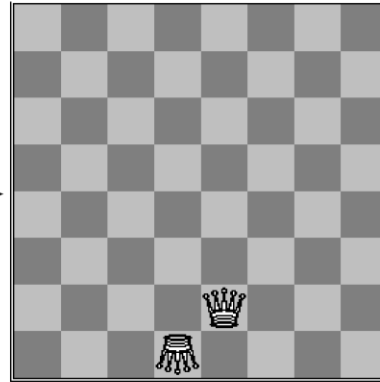
Toy-world example: Towards *chess expertise*

Data

Actual observed board

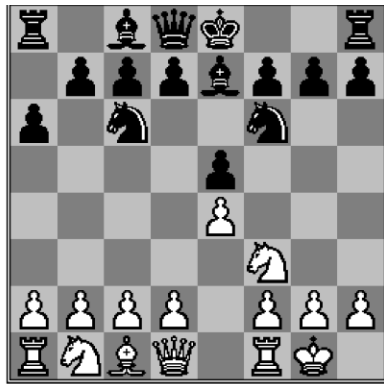


Actual observed move

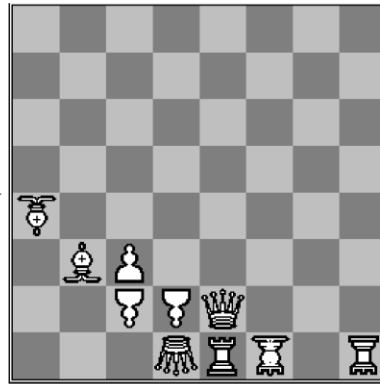


Matched features weighted appropriately + summed

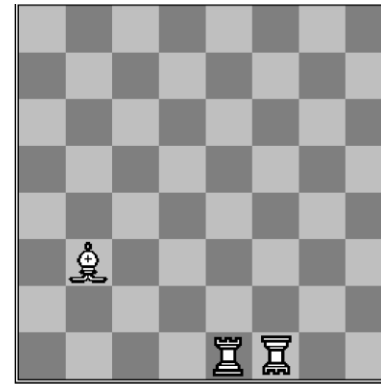
Reconstructed board



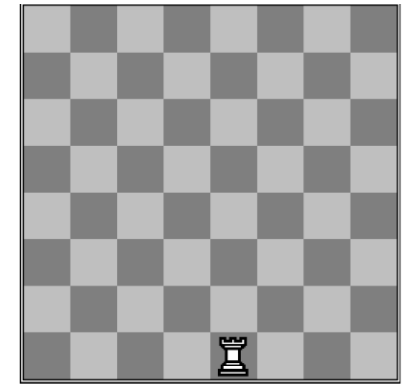
Estimated hot spots



Hotter spots



Hottest spots



- From rules to *strategies*
- “Hot spots” = there has existed *movement*
- These are the routes of *information flow*
- Goal: “State of flow”

Model

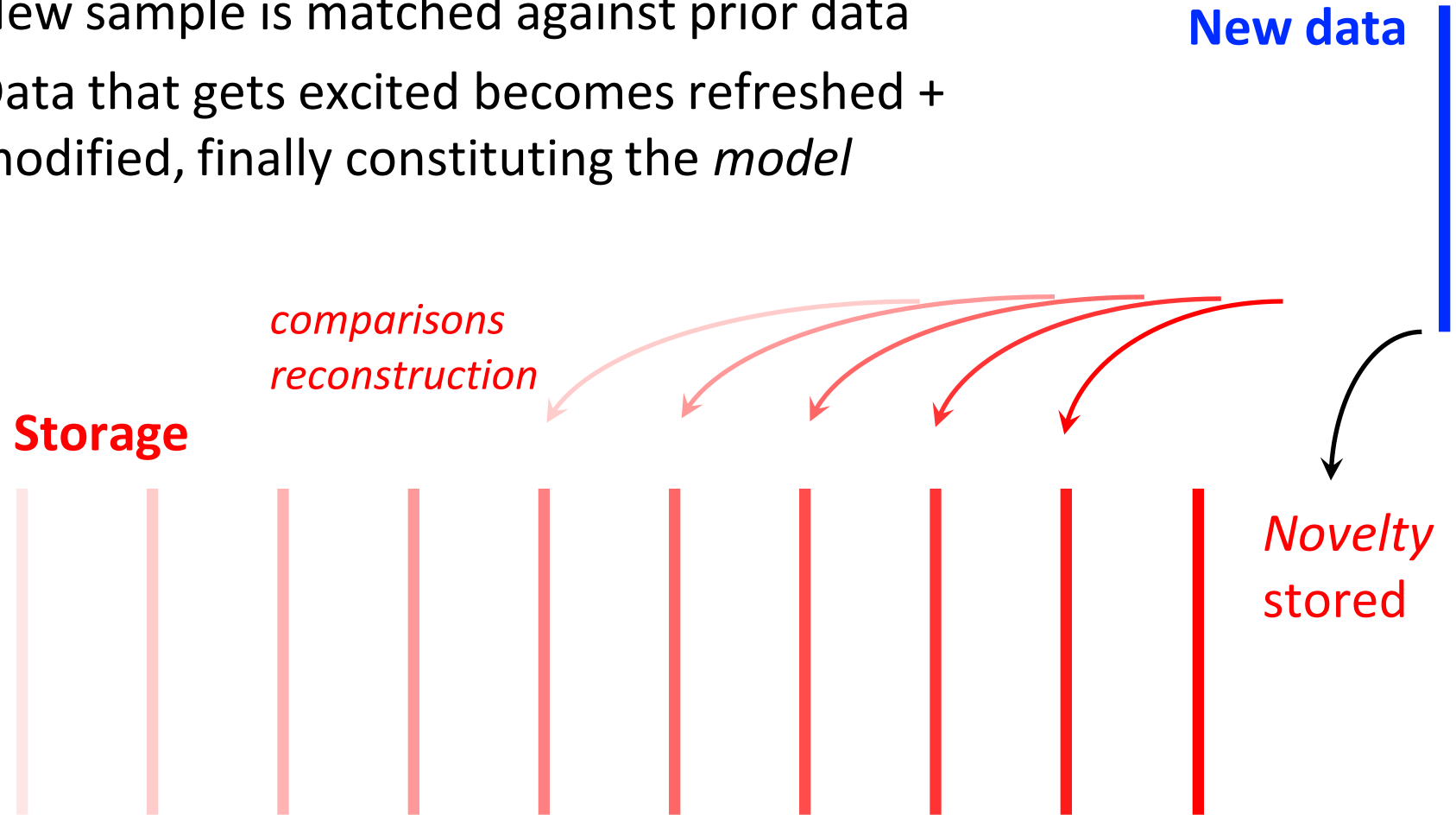
Less structured domains: Emphasis on *data*

- *To make things understandable, everything has to be given interpretation directly in the holistic freedoms/flow perspective*
- What is the freedoms-oriented interpretation of the constraining parameter/variable vectors?
- *All is narratives, prototype freedoms, fragmentary examples of surviving: Observations of how to get through the constraints*
- When variations of stories are experienced, they are compressed into models, variation structure being coordinated in the features
- Leibniz: Introducing high enough dimension of feature vectors, all kinds of objects (like the stories) can be expressed
- The “flow tube” interpretation of representations makes it easy to simplify the representations – to *unify data and model*



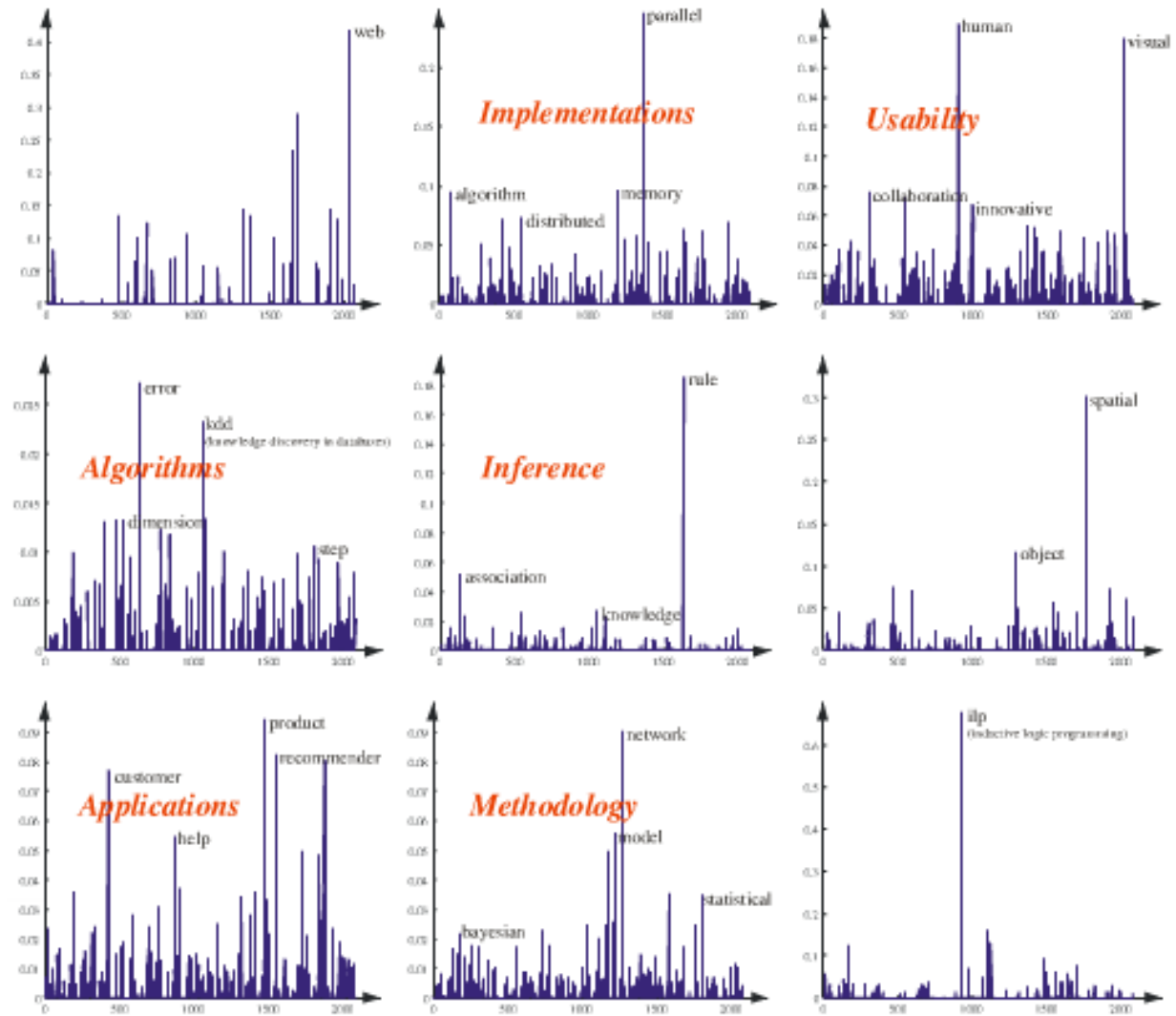
Data / model similarity

- New sample is matched against prior data
- Data that gets excited becomes refreshed + modified, finally constituting the *model*



Experiment: Compression of “narratives”

- Material: Articles on “data mining” coded in terms of words in them (simplified case where words have no deep structure)
- Common features collected together resulting in higher-level “keywords” to be applied as “coordinates”



Flexibility of neurons demoed: *Mixing of levels*

- Normally, the filter model is defined on the emergent level, giving *pattern matching*; however, *data can now be model for other data*
- Iterate until $\tilde{u} \rightarrow \bar{u}$, etc., for all data in the data sets of u and y :

$$\tilde{u} = u - qE\{\bar{u}\bar{x}_u^T\} \tilde{x}_u$$

Find the balance of the spring system
Note that couplings q are adaptive too

$$\tilde{y} = y - qE\{\bar{y}\bar{x}_y^T\} \tilde{x}_y$$

Level 0: data whitening and rotation

$$\tilde{x}_u = qE\{\bar{x}_u\bar{u}^T\} \tilde{u} - q\tilde{z} \tilde{x}_y$$

Level 1: Normalized hidden variables

$$\tilde{x}_y = qE\{\bar{x}_y\bar{y}^T\} \tilde{y} - q\tilde{z} \tilde{x}_u$$

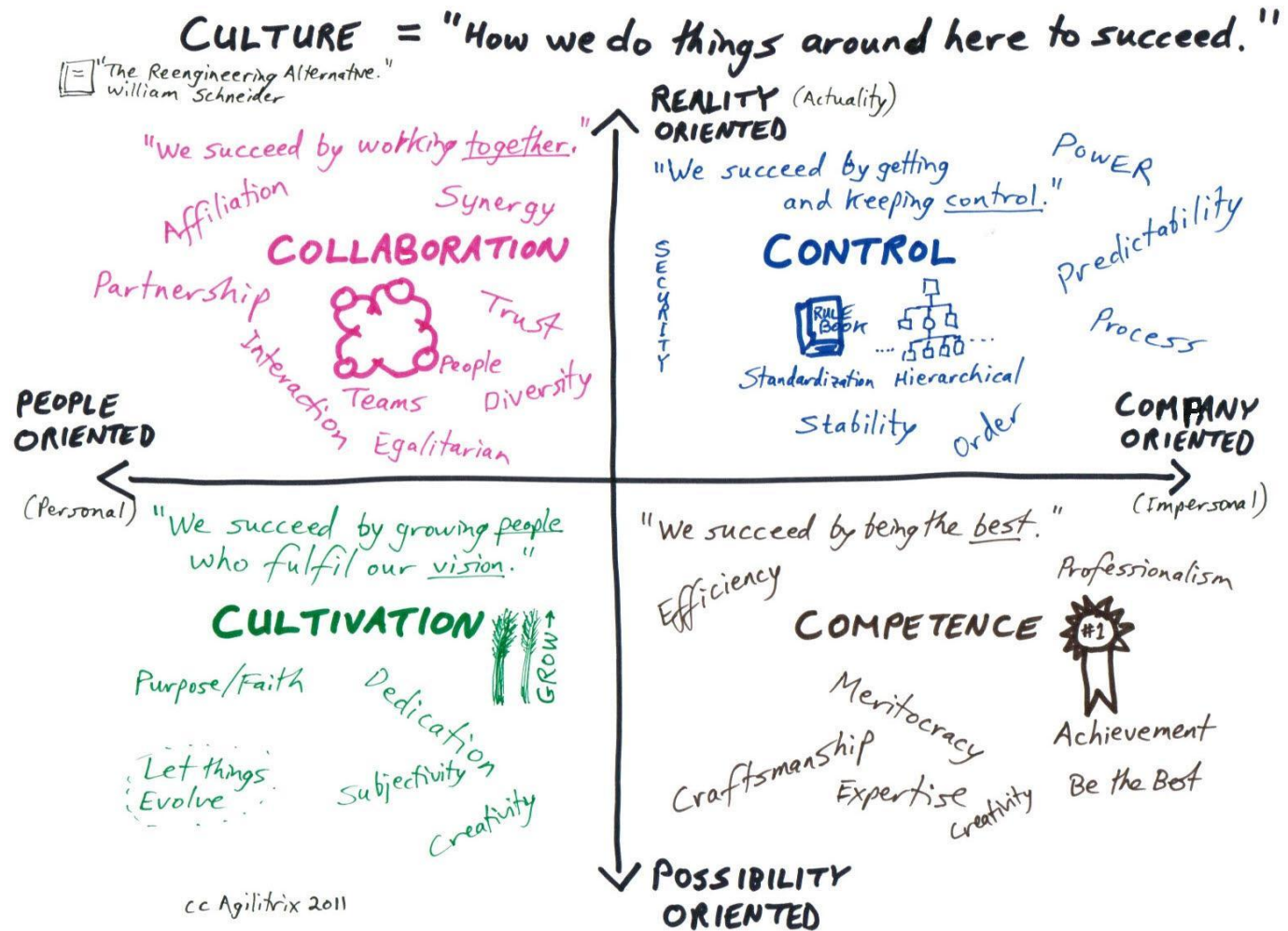
“Model” y *“Model” u*

$$\tilde{z} = q\tilde{x}_u^T \tilde{x}_y = q\tilde{x}_y^T \tilde{x}_u$$

Level 2: Maximization of correlation

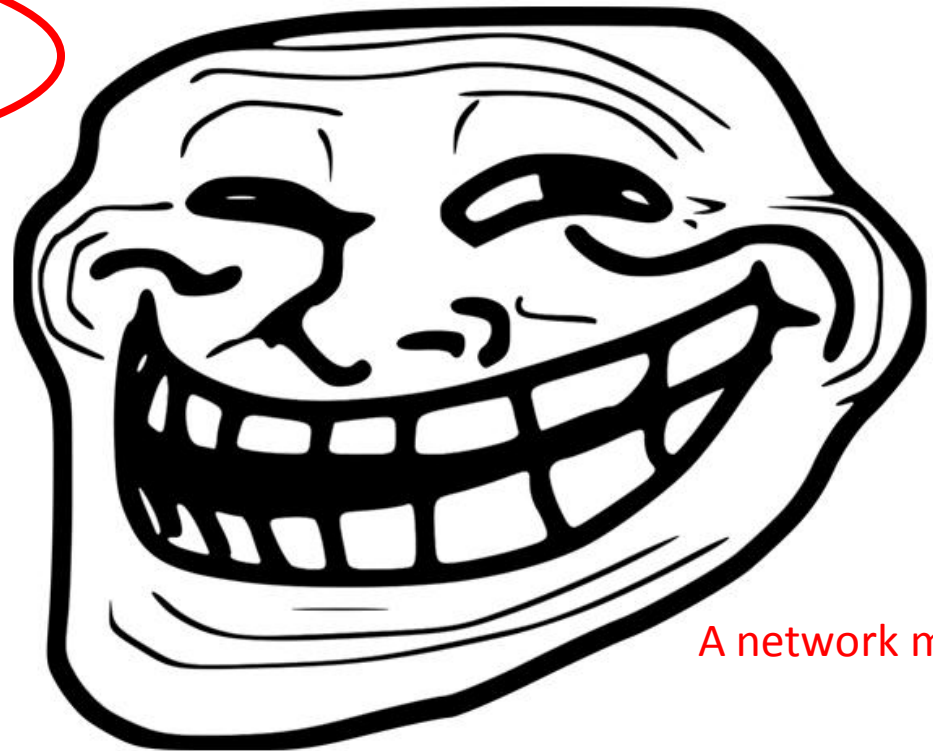


Top level: *Culture*, collection of common narratives



More generally: *Memes* as “culture genes”

- Generalization of the “narratives”, introduced by Richard Dawkins in the 1970’s
- The “power tube” interpretation of memes (and genes!) helps to circumvent technical details that have been haunting the ideas
- “Control memes” (cf. *control genes*) needed
- Feel of paradoxality: Dawkins is a radical atheist – but it may be that his memes give new credibility to spirituality (later)



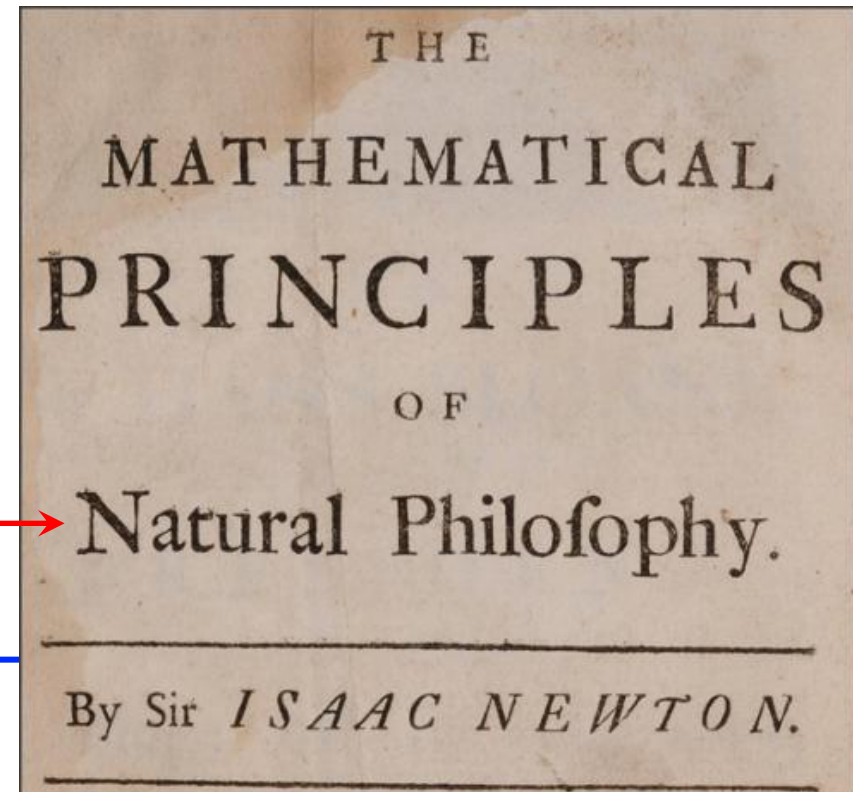
A network meme



Memes/gen
are bound
together

Consilience of “two cultures”?

- *Is this real science?* Are the presented hypotheses falsifiable?
- “Mental energy” is in principle measurable; pattern recognition of the “brain wave landscapes” could also be carried out?
- Compare to Tom Mitchell’s work on locating “thoughts”
- ... But this all would only mean that reductionism still rules
- If science cannot address the most relevant of questions, is changing of paradigms enough
- Looking at things in a wider perspective is *natural philosophy* → ... or is it just *plain philosophy*?



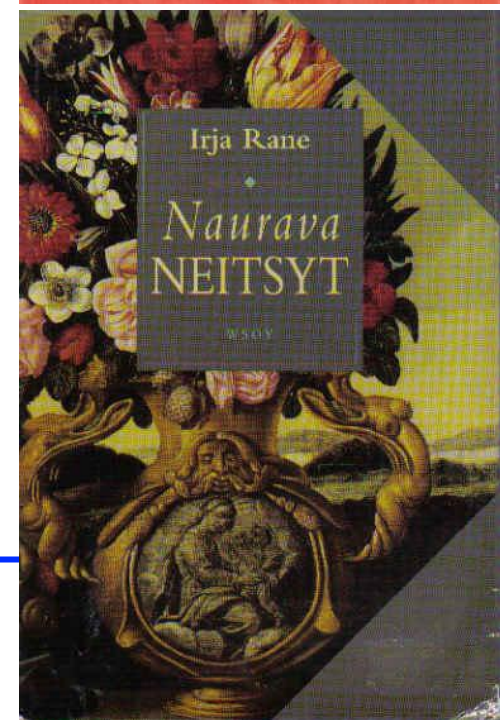
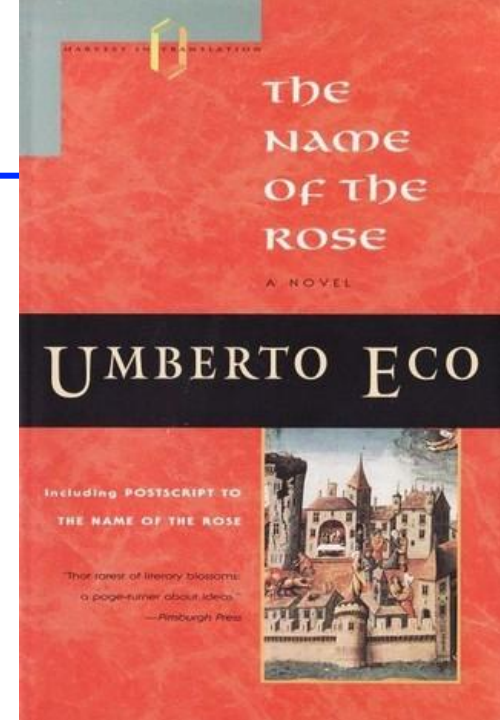
Along the flow of intuition

- Rather than sticking to formal correctness, the key challenge is to *keep the flame burning, intuition flowing*
- How to reach that? – Indeed, *this has been rehearsed since the dawn of civilization*
- Uncoded “data” is the *narratives*, some kind of *sample freedoms*, and there is plenty of experience of what the best stories are like
- One can learn something from the best of storytellers, like Shakespeare, or from the successful stories, like religious texts ...
 1. *The stories follow the model, but there is a twist, diversion from the expected, causing internal tension (and new flow) in stories*
 2. *The key mechanism for spreading the “flame” to new domains is by using **analogies, metaphors or allegories** (examples later)*



Exploiting the most complex “data”

- Literature and fiction – new evidence available, highly preprocessed and conditioned, sparks of ideas, ready to be matched against experiences
- For example, study the two books:
 - Umberto Eco: *The Name of the Rose* (1980). What has happened to Aristotle’s lost book on *comedy*, and why?
 - Irja Rane: *Naurava neitsyt* (1996). Why is Madonna always smiling in pictures, why is she never *laughing* out loud?
- Good questions ... perhaps the appropriate insight here is that laughter is *dangerous*, it shakes the fixed structures, challenges dogma
- **Conclusion:** Humor brings “vibration” in stories, providing *sanity testing* and “life” to structures!



Excuse

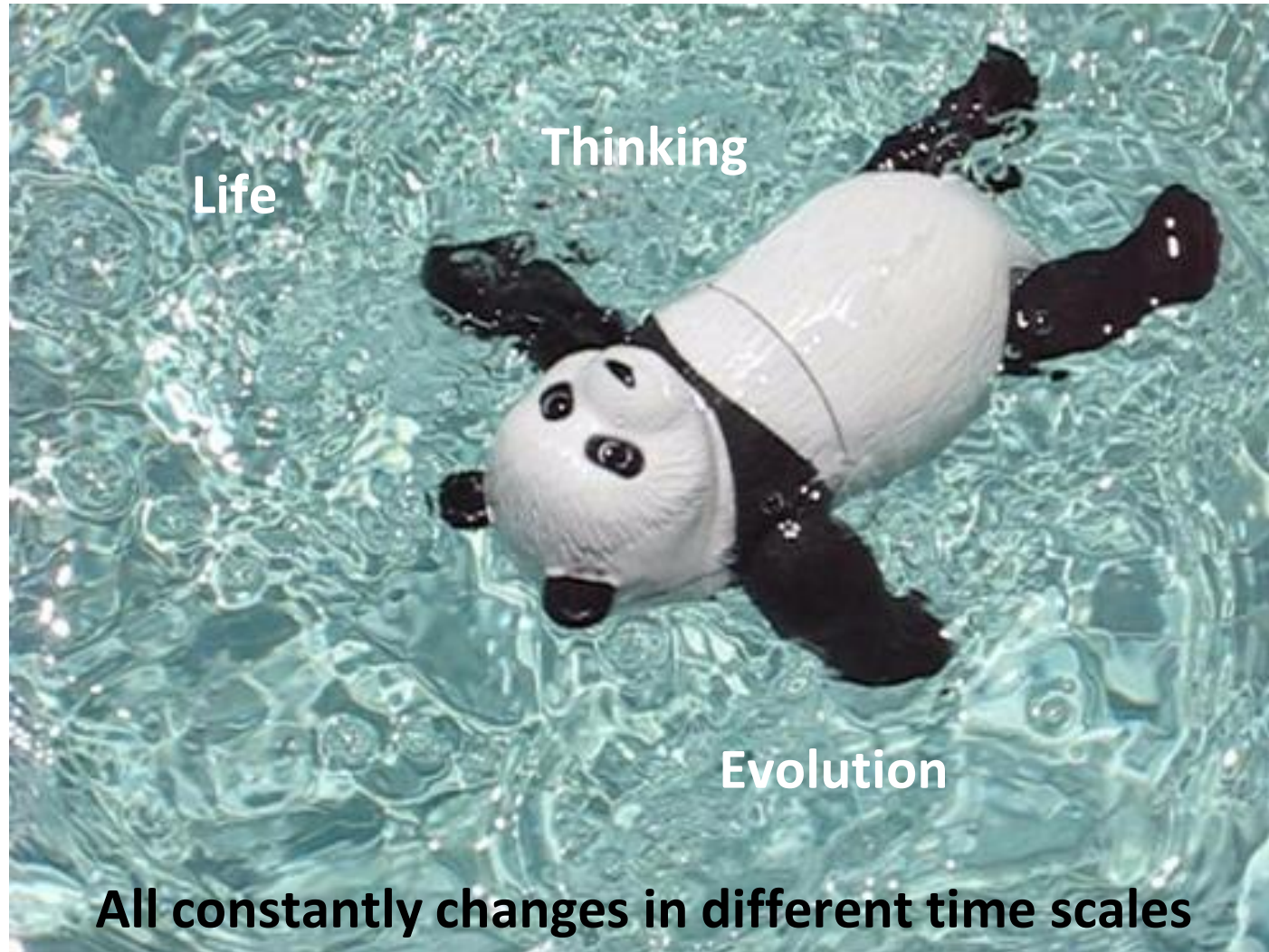
- ... Does this set of slides feel like ... *somehow confusing*?
- This is actually yet another experiment in “dual-form learning”
- The goal is to reach a train of insights, hopefully opening a channel for a personal new flow
- Different minds are open for different kinds of insights, and there is something for everybody!
- Indeed – again, this all is nothing really new – everything is already there “in the dawn of one’s understanding”.

The teacher ... leads you to
the threshold of your mind.

– Kahlil Gibran



The best of the analogies: Heraclitean *water*

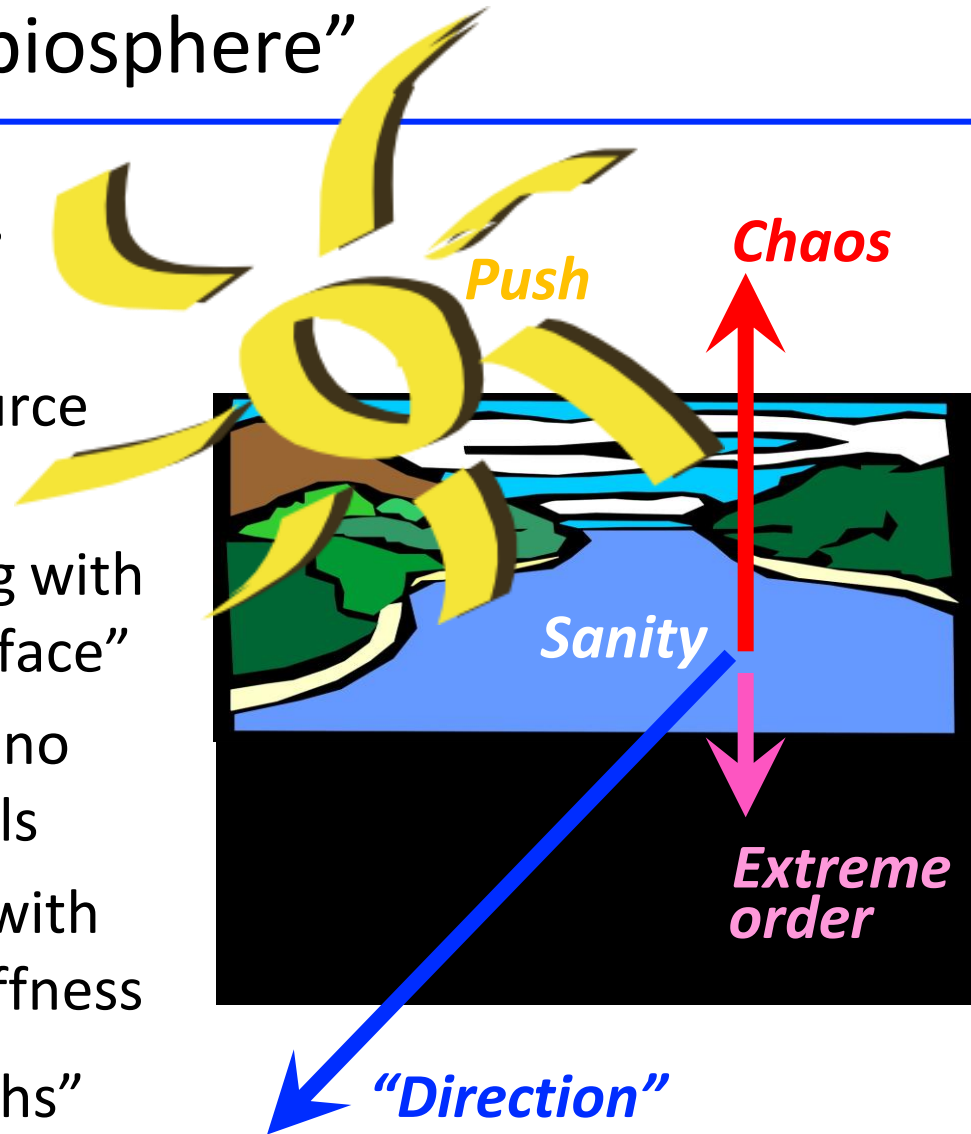


*Pan***d**a Rhei!



“Mental biosphere”

- *Objective “truth” is confusing.*
 - How about the following:
 1. **Fire** is the sun, energy source making it all run
 2. **Water** is the running thing with few freedoms on the “surface”
 3. **Air** has infinite freedoms, no correlations and no models
 4. **Earth** is the fixed ground with complete controls and stiffness
- It seems such subjective “truths” give a solid basis for a world view.



Waters-based thinking strengthened

- Remember *statistical physics*: Temperature (and also pressure) is an emergent function of average kinetic energy of particles, or directly related to velocity enformation
- Remember *bond graphs*: Entropy flow (and volumetric flow) is the “flow variable” when temperature (pressure) is used as the “effort variable”
- Thus, there is a real-life two-level emergence process going on in real-life flow systems; further, the lumped parameter models can be extended to distributed systems
- **CLAIM: The enformation flows in large-scale systems can be understood in terms of real matter flow phenomena in systems (Navier-Stokes equations resulting in highly nonlinear models).**



Examples of personal flow visions

- In a society
 - Bernsteinian *socialism* and the process of social development
 - Arendt's lines of *force* in a society
- In all nature and physics
 - Bohm's *holomovement*
 - Schopenhauer's *will*
- More poetically
 - Schiller's *joy*
 - Malick's *grace*
- Finally ... that *love*
 - Lennon's "All you need is love"
 - Freud's *libido*



... And then, of course,
there is Pirsig's *quality*



Facing the world: Eternal struggle with constraints



You start with this



HELSINKI UNIVERSITY OF TECHNOLOGY

Control Engineering Laboratory

Cybernetics Group

Routine life: Single route through the jungle found



"Uomaelämä"



Still higher visions: Alternatives, optimizations ...

Personal mastery



Finally: The free flow inevitably becomes exploited

- Suddenly the flow is gone, the “evolutionary avantgarde” is all somewhere else
- Controls take over
– *by somebody*



Spirit comes first ... then comes control

- The flow of life powers is overwhelming, wasteful – until it gets exploited
- The values are utilized until everything changes to blur, loss of meaning
- All innovativeness is used to exploit the *variable* as efficiently as possible

...

*Freude heisst die starke Feder
in der ewigen Natur*

*Freude, Freude treibt die Räder
In der grossen Weltenuhr.*

*Blumen lockt sie aus den Keimen
Sonnen aus dem Firmament
Sphären rollen in den Räumen
die des Sehers Rohr nicht kennt.*

...

*Freude trinken alle Wesen
an der Brüste der Natur
alle Guten, alle Bosen
folgen ihrer Rosenspur.*

*Küsse gab sie uns und Reben
einen Freuden-Geprüft im Tod
Wollust ward dem Wurm gegeben
und der Cherub steht vor Gott.*

**Intellect comes afterwards to
implement the foreclosure.**



Ridley Scott: *Gladiator* (2000)

- “There once was the *whisper* that was Rome”
 - Simple, guiding live spirit; Rome was a *process* pushed by some *force*
- Compare: “There once was the *idea* that was Rome”
 - One can only think of something one already knows – and more of it!



Suuri kansalaiskeskustelu hyvinvointiyhteiskunnan tulevaisuudesta

Eduskunnan Tulevaisuusvaliokunta kutsuu kansalaiset visioimaan, millainen Suomi voisi parhaimmillaan olla, jos se keksittäisiin vasta nyt. Millaisen hyvinvoivan valtion osaamme kuvitella mahdolliseksi tässä maailmantilanteessa tällä viisaudella teknologialla ja

- Compare: There once was fuss that was this Himanen



What one should listen to: Whisper that is Finland

- It all starts from below, from minor sparks in individual minds
- Some narratives for self-esteem to emerge: ... and in *each generation separately*
... and in *each culture*
 - **Something ancient:** In the old sagas, they say that once upon a time Finland was a large kingdom, and Norway was established by these Finnish Kings.
 - Thus, it is certain that William the Conqueror, back in 1066 in Hastings, *was proud of his heritage as the successor of Finnish kings. In his mind the stories were the truth.*
 - **Something old:** The linguist J.R.R. Tolkien, when writing “The Lord of the Rings”, based elements of his Elvish language Quenya on Finnish.
 - “If there were just one language to remain, it should be Finnish”. “Getting acquainted with Finnish was like getting in a fine wine cellar full of exquisite wines.”
 - **Something new:** This winter, two Finnish divers got stuck in a cave in Norway and got drowned. The local officials said it is too difficult to get the corpses out of there.
 - However, their friends organized a secret rescue mission and fetched the bodies. You don’t speak much – in the spirit of Winter War, you just *never leave your friend.*

Ha! Ha!

*Critique
by Pure
Reason*



There are techniques to hear whispers: *Zen*

- An ancient methodology to stop the wheels of intellect – escape outside the given frameworks perhaps, force flows extrude out
- Today, the *koans* can be substituted with *paradoxes* (remember how Gödel escaped the mathematical framework altogether)
- To appreciate the challenges of an *individual* vs. the *group*, or *emergence*, for example, study the following paradox:
 - Assume that the teacher says that next week there will be an exam – but the students cannot know the day beforehand.
 - This is what a student reasons: “The exam cannot be on Friday, because one would know the day already after Thursday with no exam. But if Friday is impossible, also Thursday is, because after Wednesday with no exam one would know the only possible day. This way one can continue till Monday – there cannot be an exam!”
 - Unfortunately, the student is completely shocked when the exam is on Wednesday. *What is going on?*



Best motivation for life – touch of *death*

No one wants to die. Even people who want to go to heaven don't want to die to get there. And yet death is the destination we all share. No one has ever escaped it. And that is as it should be, because Death is very likely the single best invention of Life. It is Life's change agent. It clears out the old to make way for the new.

Steve Jobs

Your time is limited, so don't waste it living someone else's life. Don't be trapped by dogma - which is living with the results of other people's thinking. Don't let the noise of others' opinions drown out your own inner voice. And most important, have the courage to follow your heart and intuition.

Steve Jobs

Remembering that I'll be dead soon is the most important tool I've ever encountered to help me make the big choices in life. Because almost everything - all external expectations, all pride, all fear of embarrassment or failure - these things just fall away in the face of death, leaving only what is truly important.

Steve Jobs



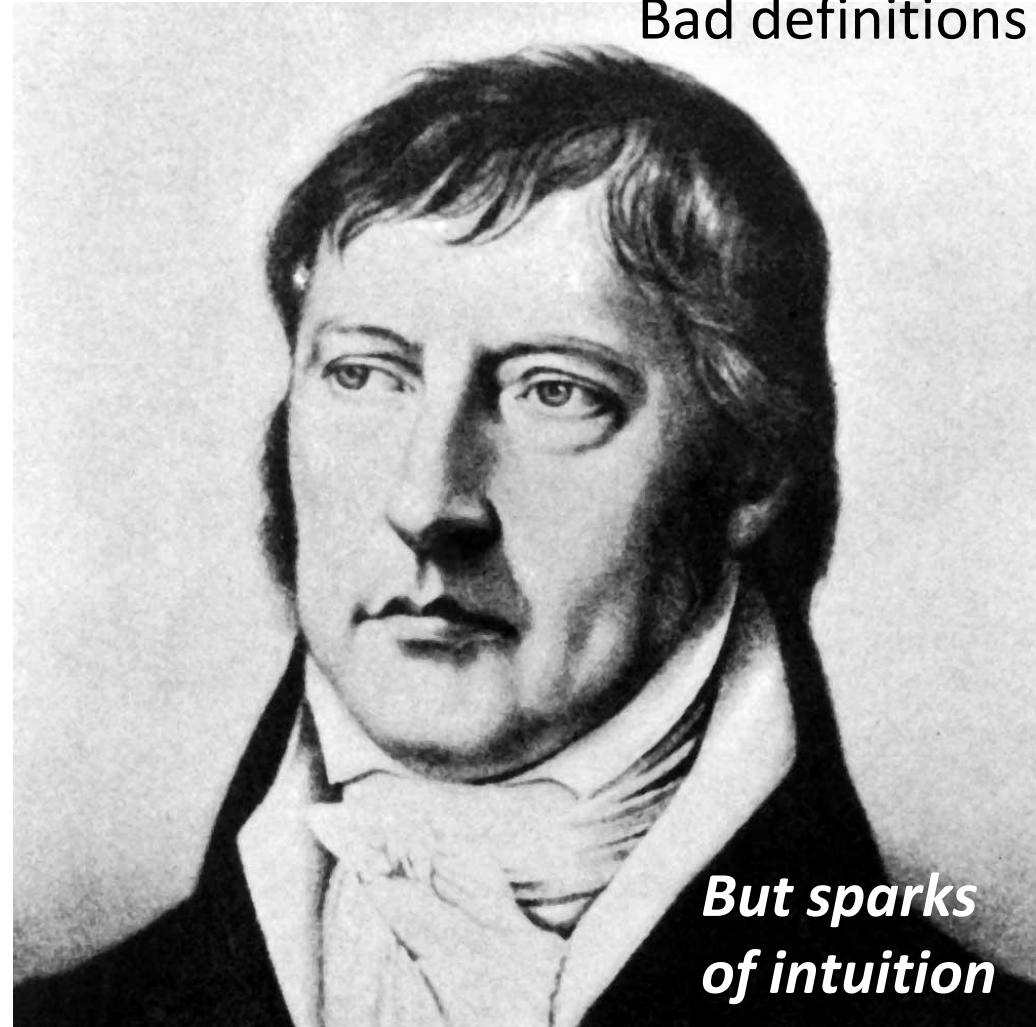
Hegelian approach to blurring fixed categories

- Hegel on “electricity”:

Sähkö: ”Se on itsestään vapautuvan hahmon tarkoitus, hahmo joka alkaa kumota oman välinpitämättömyytensä; sillä sähkö on välitöntä ilmituloa eli läheisesti hahmosta tulevaa, sen vielä edellyttämää olemassaoloa - mutta ei vielä itse hahmon hajoamista, vaan se pinnallinen tapahtuma, jossa erilaisuudet jättävät hahmon, mutta vielä ovat sen edellyttämiä eivätkä vielä ole niissä tulleet itsenäisiksi.”

... And the same in English.

Bad definitions



*But sparks
of intuition*



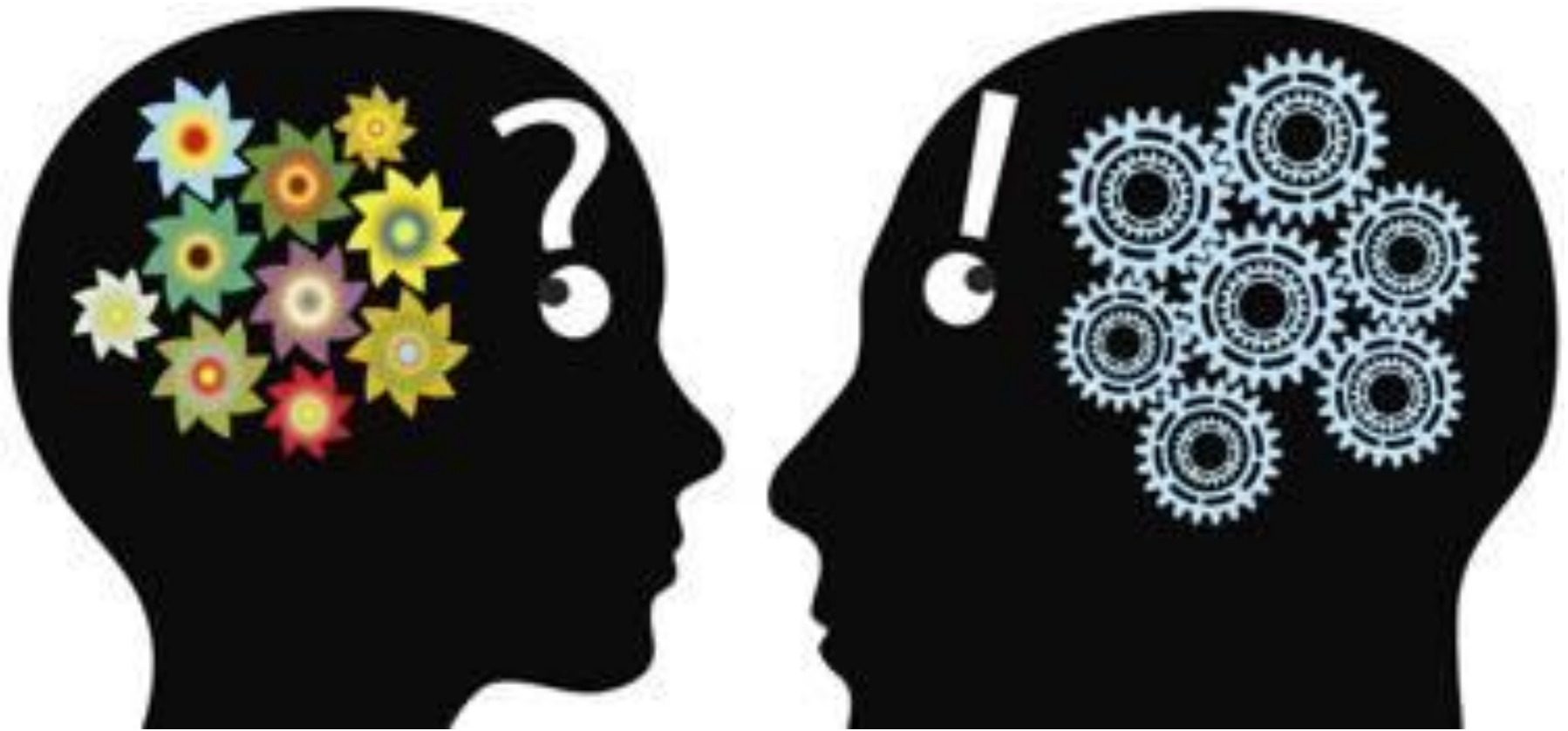
Intellect vs. intuition

- Today, controls have absolute dominance
- Intellect has reached such victories that the dialectic balance between world views is missing
- Can *flourishing* and *control* co-exist in a single system at all?

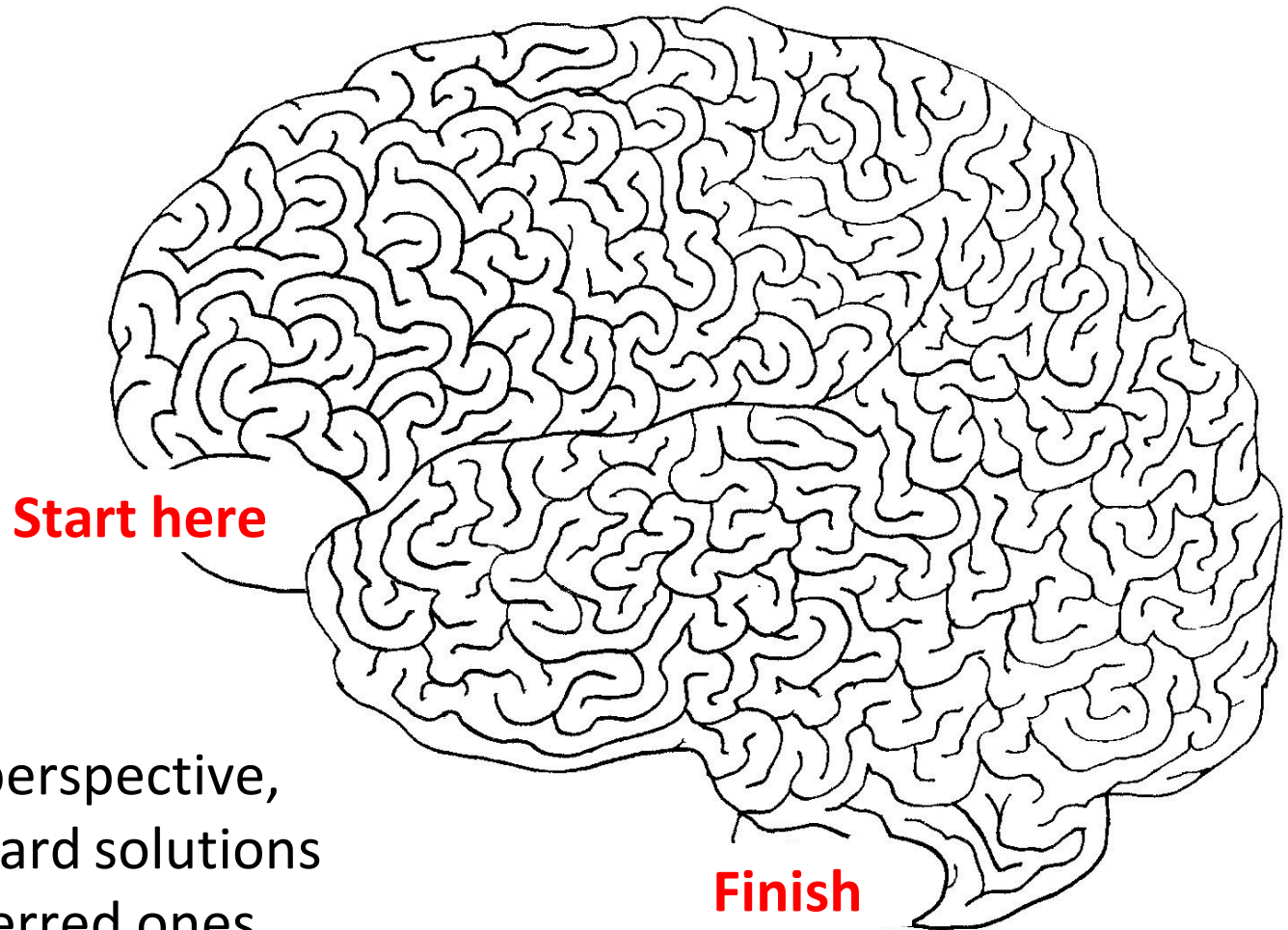


Eternal struggle – neither should dominate

- For some reason, *woman* and *man* are separate in biology, *brain hemispheres* in physiology, and *church* and *state* in a society



"Tippaleipäaivot" vs. "putkiaivot" (spaghetti brains)



- In the **dual** perspective, straightforward solutions are the preferred ones

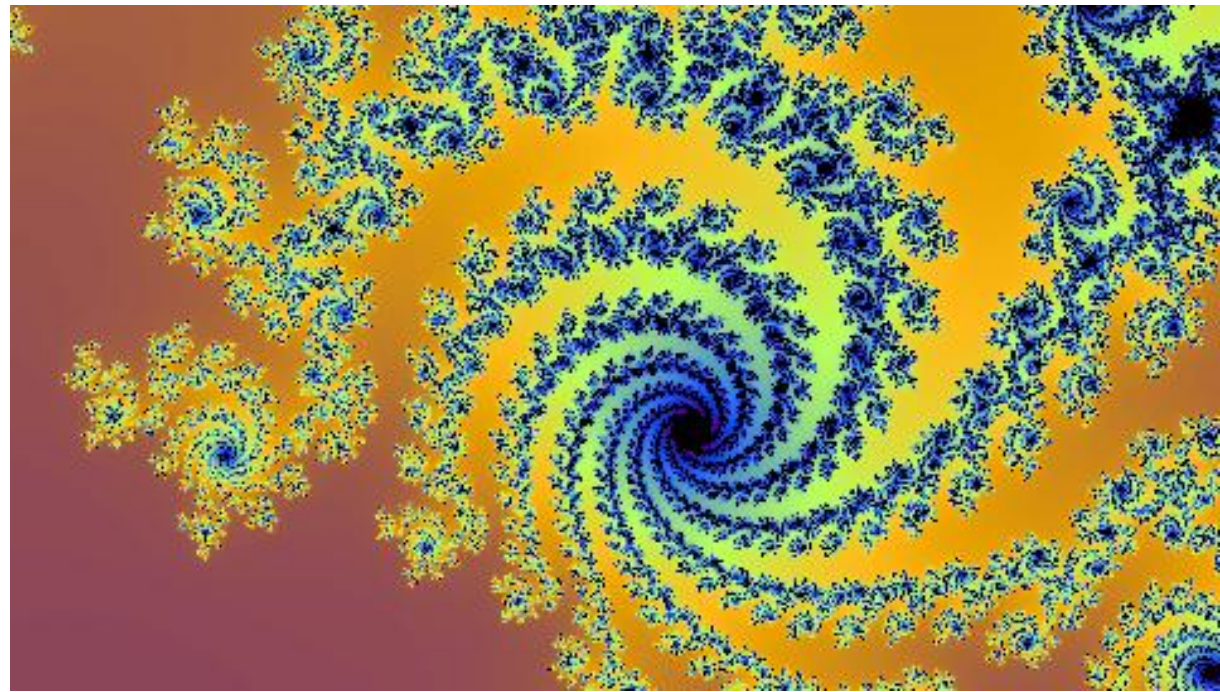


Valuable intuition: *Evolutionary struggle softened?*

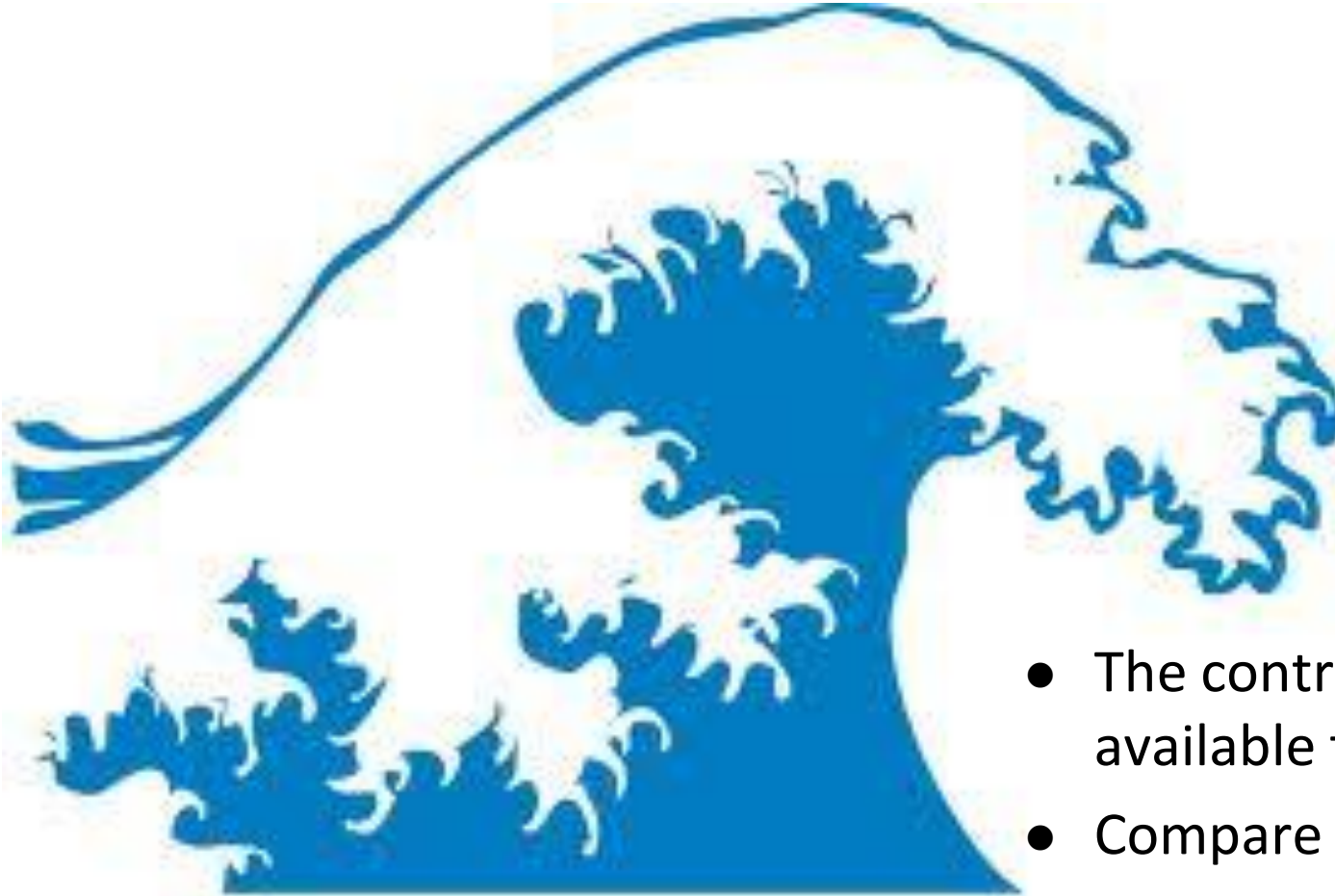
- Darwinian view: Extreme competition, there is just one winner – optimization of genes resulting in a monoculture?
- **Now: Try to make freedoms (flows) parallel, choose a *good match* – there are many winning strategies, resulting in diversity**
- **Result = parallelization of the genotype and the phenotype – adaptation of parameters can take place already on lower level**
- Only feasible designs visible on the high level – faster evolution reached, solutions directly tested against the environment
- *Saltationism*: qualitative step – find a new functionality (gene); quantitative adaptation – *simplify* its representation
- Criticism of creationists: “The gene pool mainly degenerates in mutations” – but now simplifications make flows *more fluent*



-
- Parallelity, direct channels through system levels, and sudden burst of energy, can be experienced temporarily, too
 - Flash of enlightenment, sudden comprehension, touch of *holiness*, orgasmic experience, use of hallucinogenic drugs (?), etc.



-
- Still, the wavefront of evolution destroys linearity and simplicity

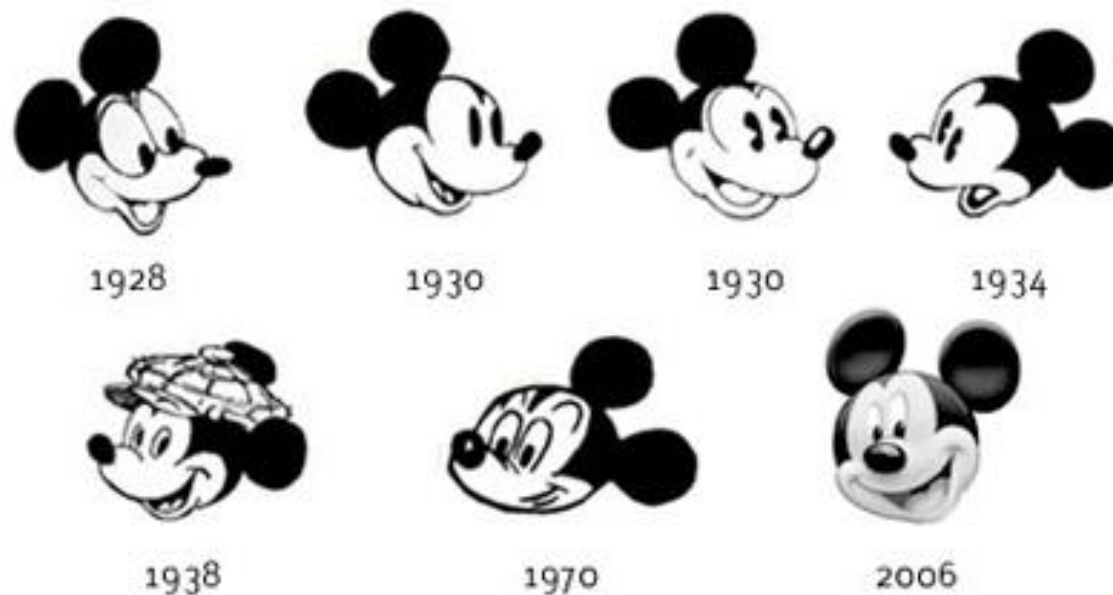


- The controls overtake the available free info flow
- Compare to SETI research!



Nature of waves: *Forward through the barriers!*

- Flow perspective: *Maximize enformation flow through the system*
- Local, subjective criterion – future is not predetermined
- Always the same “fitness”: *Generalizes over systems and levels*
- **Free of concrete evolution mechanisms**

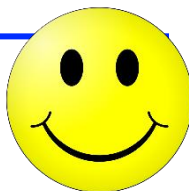


**Criterion
= flow of
money?**



“Artificial life” with “material vitalism”?

- **Money:** Trying to make real life better quantifiable, dynamics of interactions more lucid and visible
- **Prices:** Value of everything made objective to everybody rather than subjective
- In the era of globalization: No limits to money flow – the real dynamics is let loose
- Economists still look at the structures only after their emergence – they are always late, *they really do not understand*
 - Money is not only a symbol or a measurement unit – now it is the kernel of a live process, not governed from above
 - New intuitions: Money is no more essentially a “storage of value”; *money as a “life force” only exists when it is in movement!*
 - Strange dynamics (“bubbles”) due to new innovations: Inflation, “money as debt”



The most objective through the most subjective

- For more generality, emphasis can be extended from “mental energy” to *mental entropy*
- The environment is driven to “heat death”, minimum of “thermal noise”, when the structure is seen in an “inverted perspective”
- Rather than surrounding the system, the environment is seen to be “at the mercy” of the controller that sucks out enformation
- Fully tuned control – all *modeled* variation (free energy!) becomes eliminated (extracted and transferred further), only noise remains
- “The Principle of Maximum Entropy Production”: In optimum, *entropy becomes produced at the maximum speed*
- **Note: This most objective global principle can only work in subjective worlds, within a domain of a *single model + control***



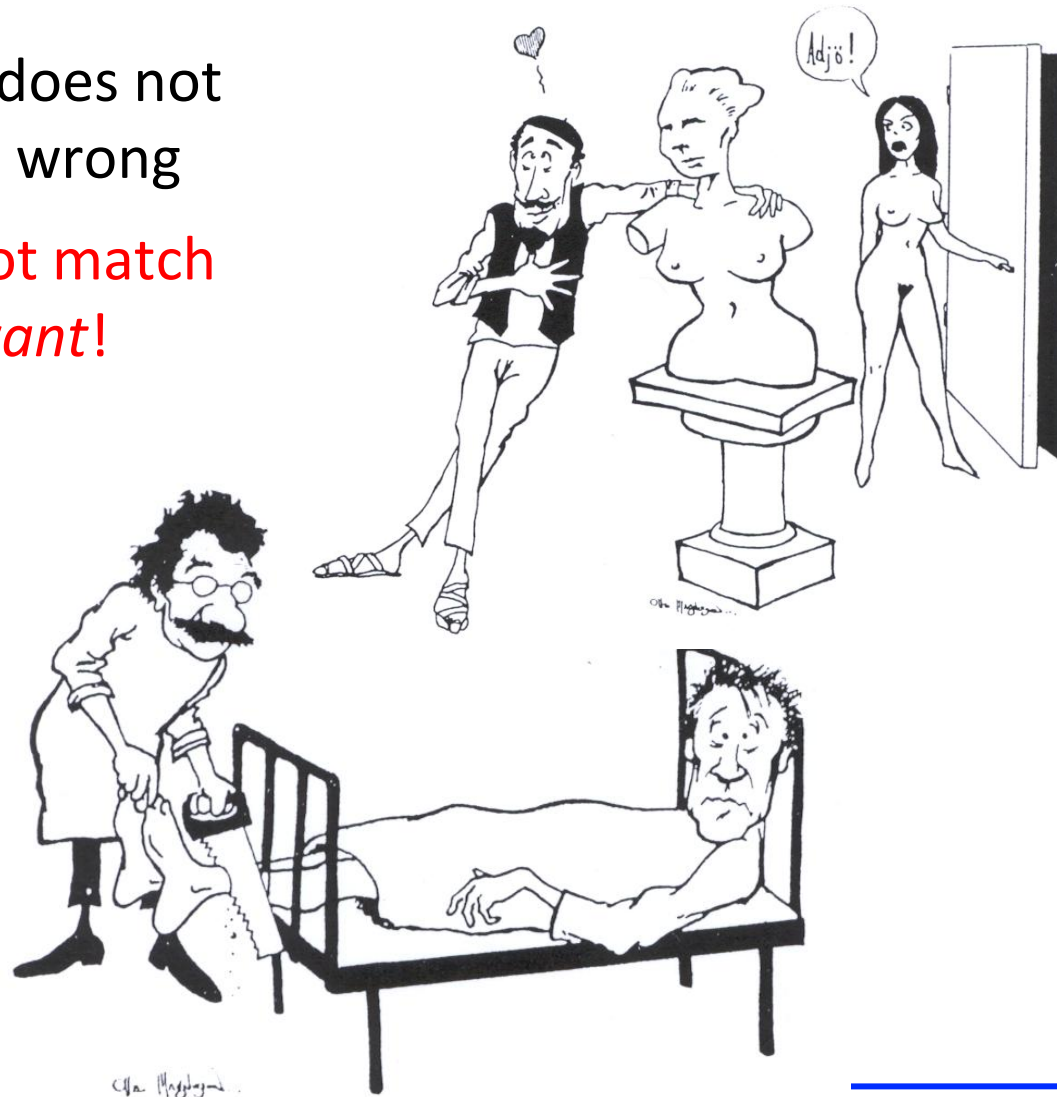
“Mental Quantum Theory”

- An idea does not spread if the new mind is not *fully* convinced
- This becomes visible in *coupling problems*
- Basic unit in group dynamics = *one mind!*



Subjective world: *Modeler's Paradise*

- Traditionally: If the model does not match reality, the model is wrong
- **NOW:** If the model does not match reality, the *reality is irrelevant!*
- One can only see what the filter makes possible
- What *else* is dictated by the assumed structures?
- What the *most natural world view* looks like?



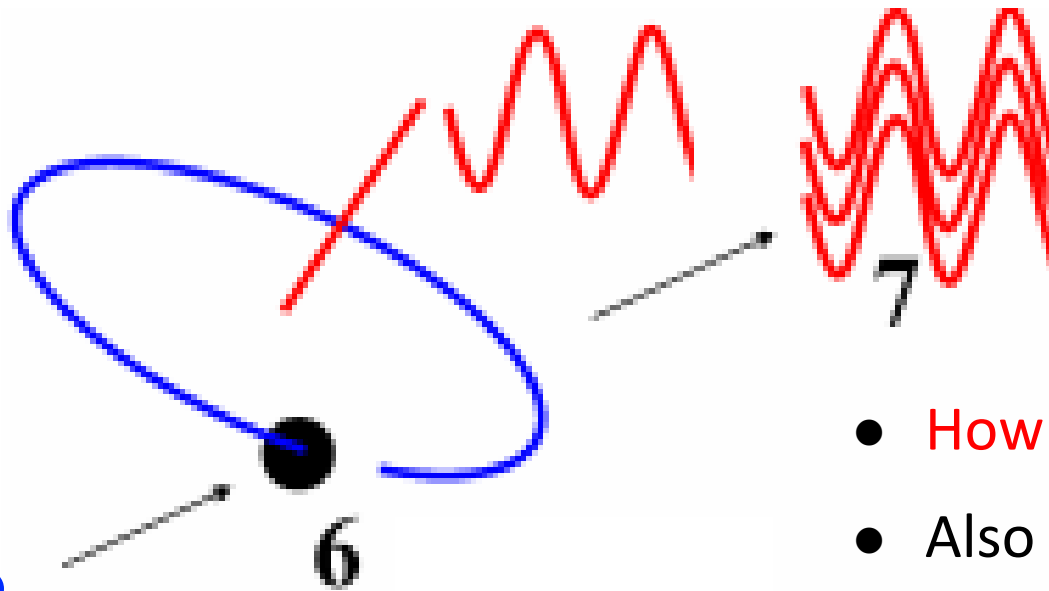
Everyman's Paradise

- Where is the “intellectual avantgarde” today?
 1. First, there is *chaos* and *uncertainty* in the outside world – **science** and modeling are efficiently employed to clarify system properties
 2. Then, there is *order* – **engineering** is used to exploit the models and control the environment to make it behave as one wants to; this has largely been reached
 3. Now, we are back in *chaos of the next level*: there is complete freedom again – **economics** invents new worlds with new needs that never existed before!
- Today's society ideal: a *shopping paradise*?
- Towards *added value* rather than only exhausting existing values
- Is imagination/innovativeness enough to find new directions?
- Is there a possibility of any reasonable direction in developments?
- Can some “metamodel” help to avoid the emerging mental chaos?



View on the highest inter-system level

- It was observed that neuron groups start oscillating ... finally the whole brain state should be characterized by vibrations and *fields*



- How to match this with the *flows*?
- Also *changes are in change*; there is no absolutely constant flow
- In a wider scale, really, the *flows seem to oscillate*

Morphic fields and resonances

- Rupert Sheldrake: *There are “fields” that connect all systems*
- However, there are no physical mechanisms to implement them – such views are today being classified as *pseudo science*
- But now, in the subjective world, the fields need to exist only within the head – and the world gets matched against this model
- The human is like a receiver-transmitter, selecting some bands from the multitude of the “surrounding” fields
- To interact, the “tuning” has to be right; if the “impedances” are incompatible, there is power loss
- *Water* can still very well be used as a metaphor, making the wave fronts visible and the ubiquitous nature of fluctuations concrete



“No Man Is An Island” – but how about *that sea*?

- Isaac Newton: “... *I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before [and inside] me.*”

Consciousness = milling and vibrating *meaning* in the “sea”

Identity = *cumulated meaning*

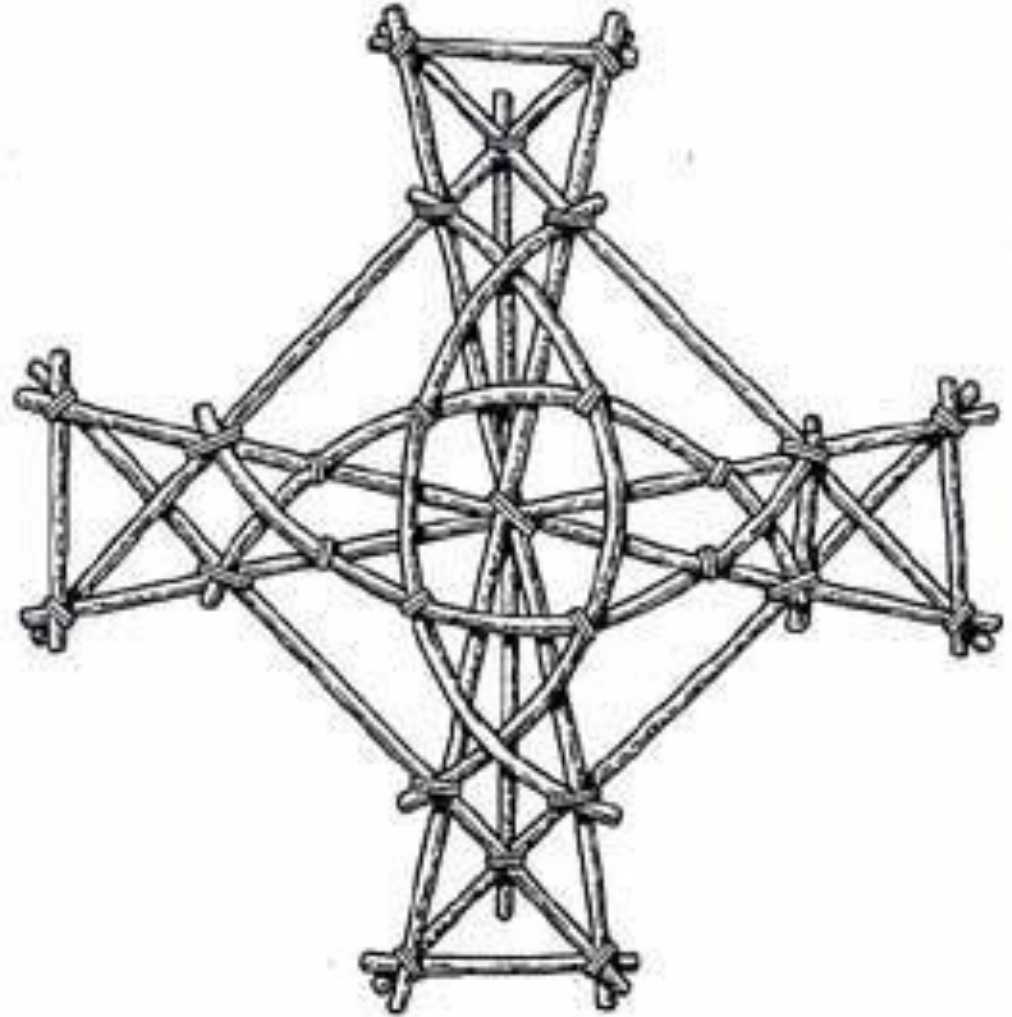
Internal (real) fields simulate also external (virtual) fields



Pattern recognition in waves

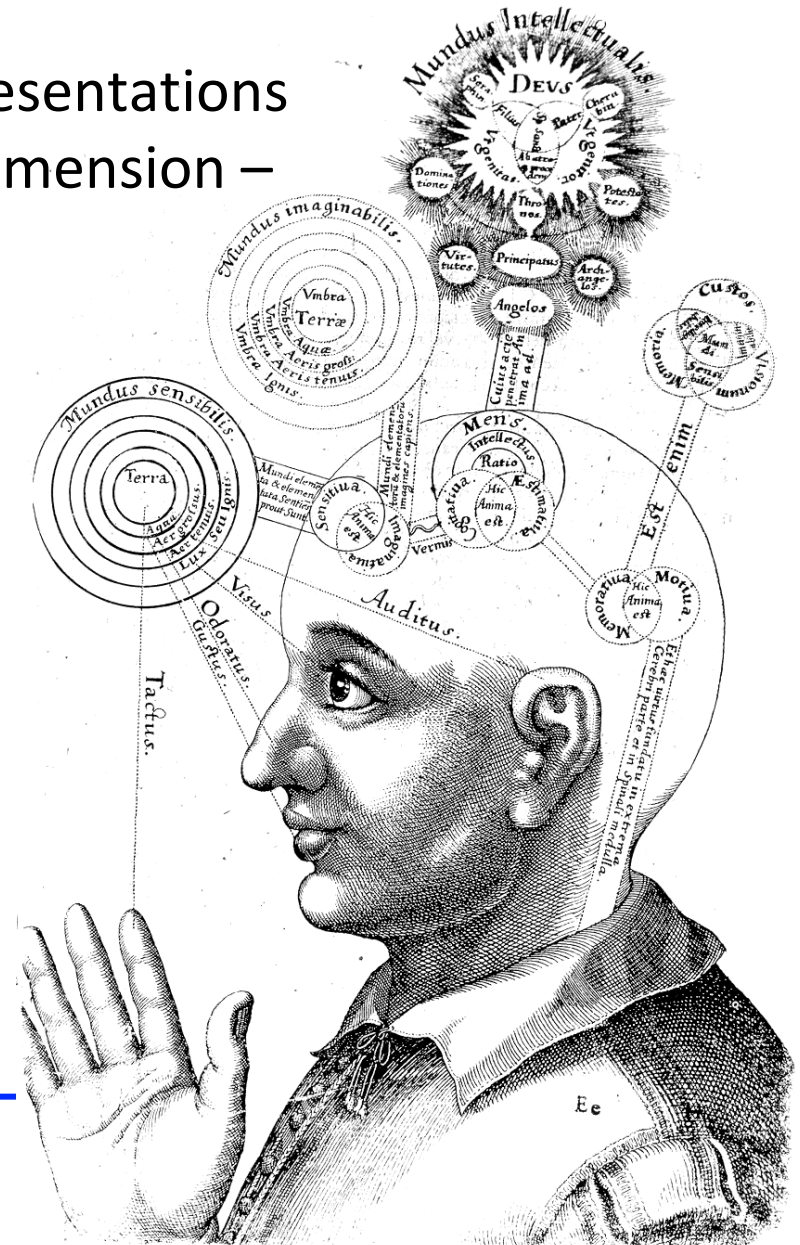
- The Polynesians were master navigators; they were capable of “seeing” far-away islands based on the wave pattern anomalies on the sea surface
- *New interpretation perhaps for that “kybernetes”?*

It is more like *navigation* rather than *steering* now



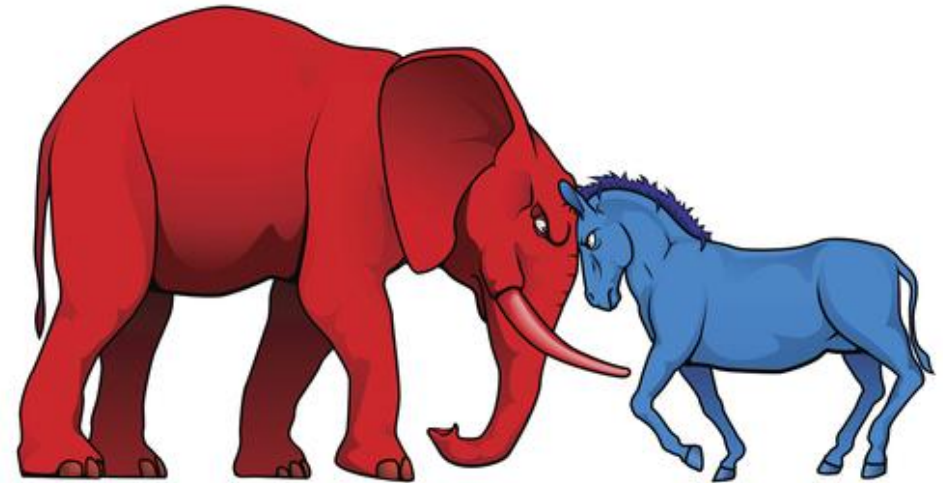
Hypothesis

- Mystery: How the distributed representations could become manifested in low dimension – as trains of thoughts?
- What is the nature of *attention*?
- Assume that the complex fragile fields obey the same principles in large and in small (see “Enformaatioteoria”)
- The boundary conditions determined by observations make the fields *collapse to simple standing waves*



Collapses of “wave functions” – *in outside world*

- As was assumed, in complex human systems the mental models *create* the reality, projecting fields, resulting in *group psychology*
- Under pressure, high-dimensional spaces collapse back to the elementary one-variable dichotomies – *also in outside world*
- Reductionistic approaches (trad. science) make the essence go away: *you can dissect only the corpse*
- Extremely complex fields of social systems, for example, if “measured” using hard enough means, can only become **battle fields**.

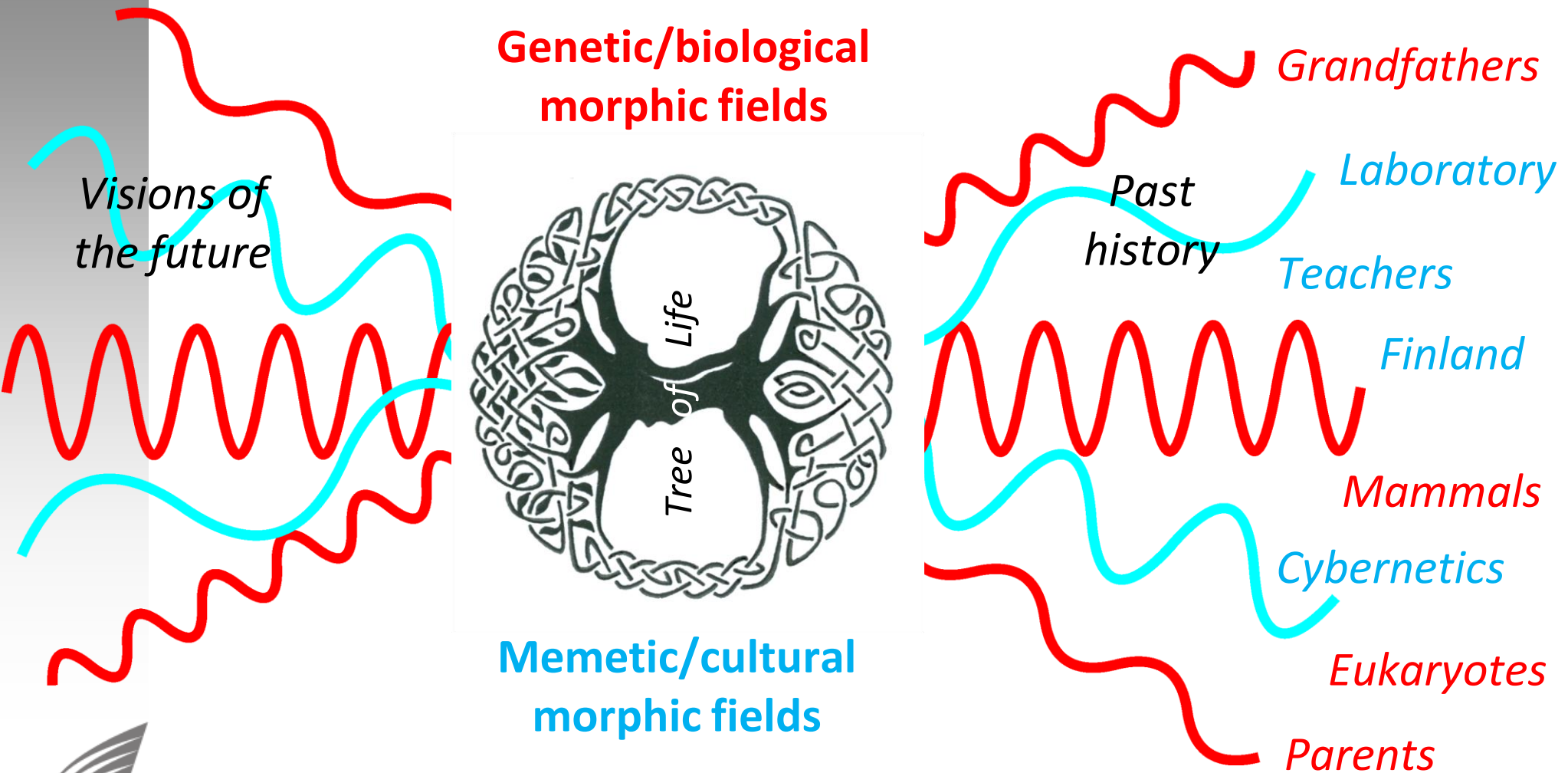


How to affect the fields – *how to live forever*

- In the long run, all ideas, all individuals are just noise, filtered away, if one does not reach *synchronicity* with one's fields
- Uphold fields without collapsing them, and make your own “twists” in appropriate phases
- Not to be delayed, one has to simulate the fields – and for that, one has to have a good model
- If you match the fields, the fields (other people) also get matched to you – you remain living in the *collective memory*
- Note again: Scientific approach makes everything collapse – the only way to understand is through intuition
- What kind of intuitions/analogies are there available for representing the flow fluctuations over eons?



Center of Mystery: antinode of standing waves



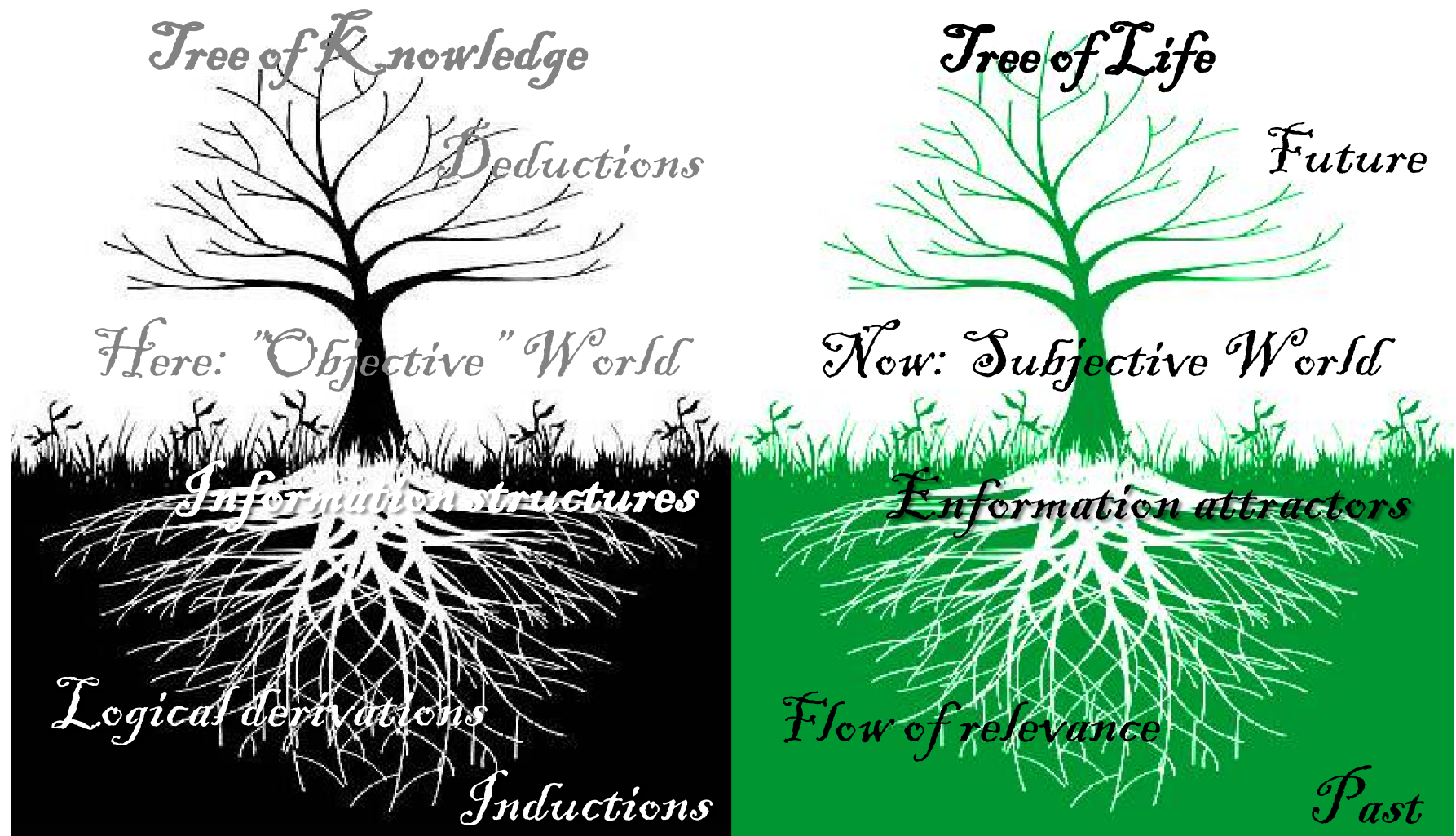
- **"Katajainen kansa" of today**
- ***You have to look forward, you must not look back!***



Actually one
should grow
"roots and
wings"



Eternal Wisdom, a Good Story



It is great to visit wise people's mental gardens

- Again, there are different ways to see the trees, and different ways to restructure the “mindscape”
- Again, parallelization: internal and external realms coincide?



Compare to Christopher Alexander, architect



This is nothing new ... indeed

- Remember what the Chinese say about gardening ...
- Spirit needs matter, something real, a concrete frame
- Formalization of the above:
Feng shui, and *Taoism* in general offering it all
 - "Flow of the universe"
 - Yin/yang dialectics and balance
 - etc.
- *But again one should not follow authorities or other constraints* →

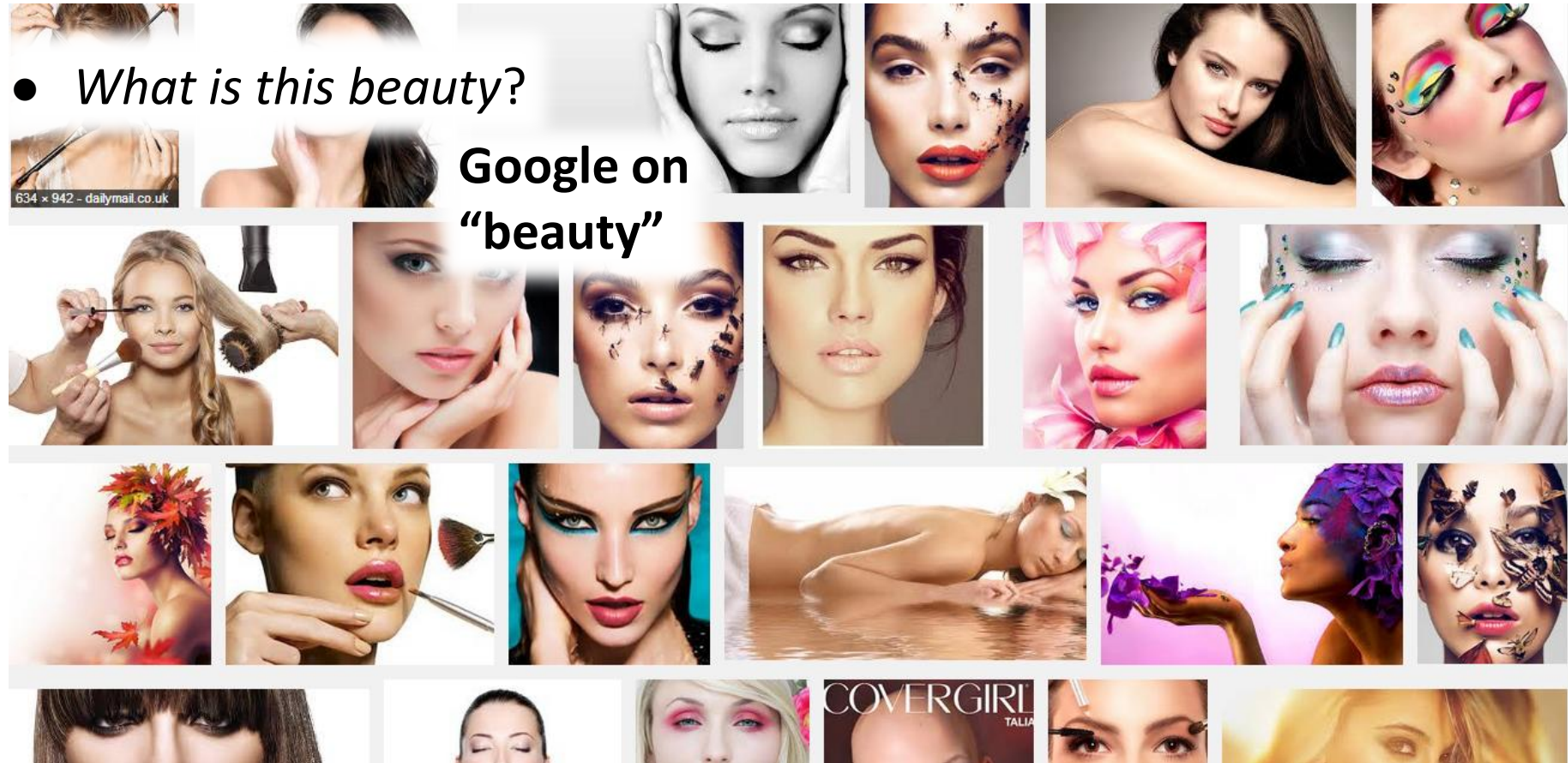


Beauty

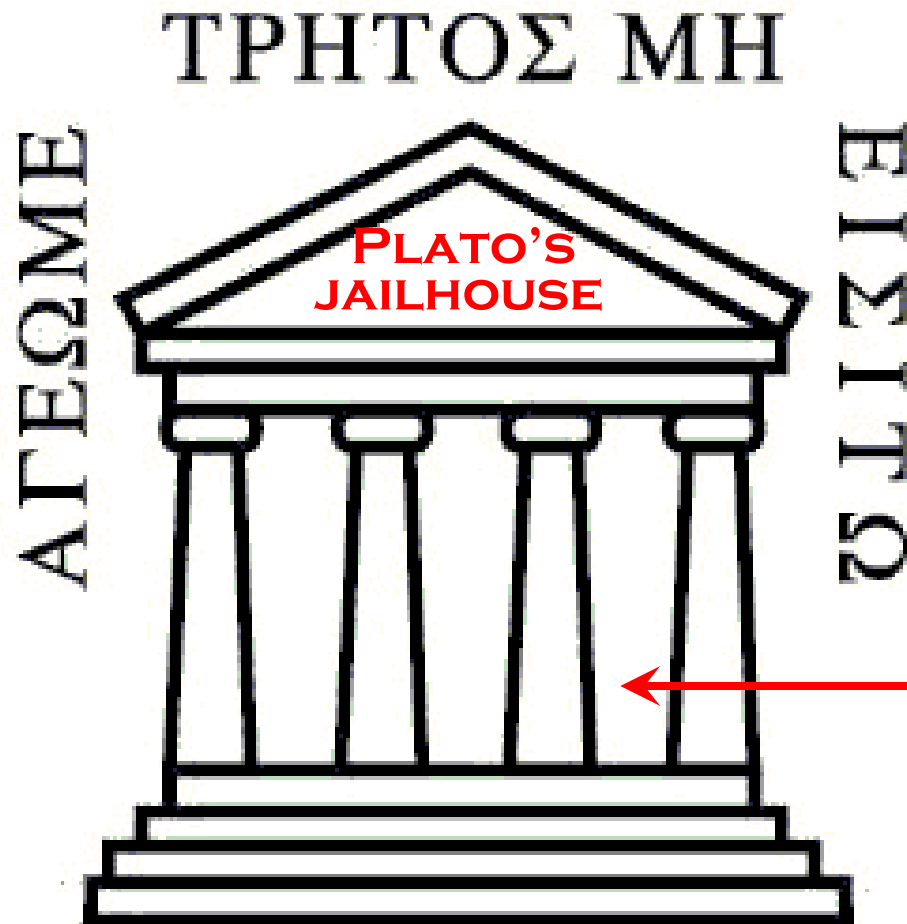
- Enfo theory: Perhaps the best guiding principle towards the *flow*

- *What is this beauty?*

Google on "beauty"



Final disclaimer: *MU*



Our revenge:

*Let no one that is happy
with formalisms escape*

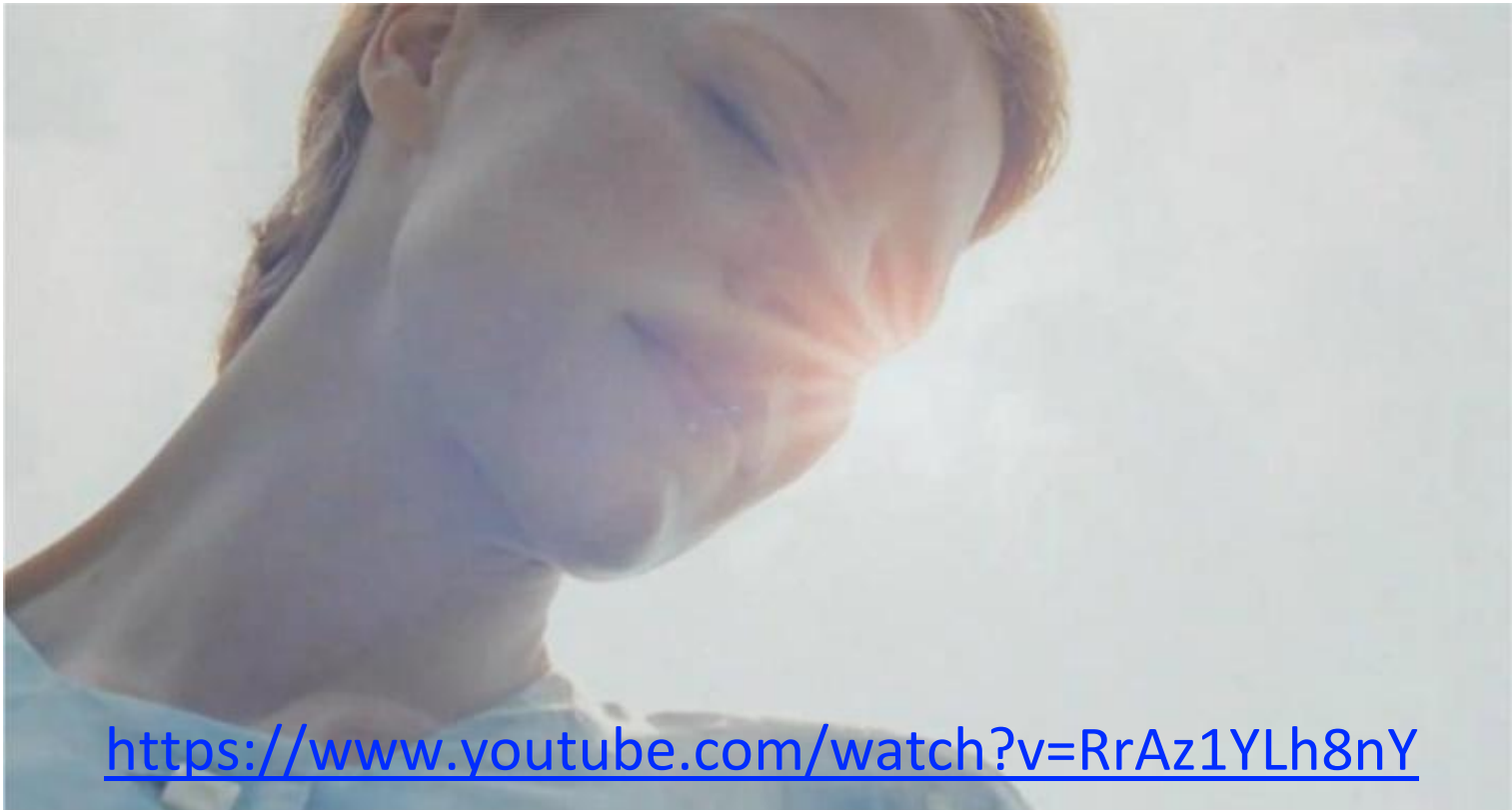
The “concept cage” is a
safe place to stay

– And there one cannot
harm others!



Terrence Malick: *Tree of Life* (2011)

- *“There are two ways through life. The way of [Darwinian] Nature and the way of Grace. You have to choose which one you'll follow.”*



<https://www.youtube.com/watch?v=RrAz1YLh8nY>



Summary – Eino Leino: *Minä*

1.

Minä oli alussa.

Minä

kasvoi luona Kaikkivallan
ja kaikki oli se Minä.

Minä on maailman ajatus,
työn tulos tuhannen voiman,
alku, loppukin elämän.

Muut on muotoja: sisällys
ylin vaan on yhteisjärki.

2.

Itseys on ihanin mahti,
minkä sait sa syntymässä:
älä anna pois ikinä!

Väärin ne sanovat,
jotka itse-uhrista puhuvat:
minkä teet parasta,
voitat, minkä alhaista, alenet.

Pyhä on yksilön perintö.

Kaitse taiten kalleutta
tai jos tuhlannet, katoa
niinkuin tähti taivahalta:
sammu tyhjyyden tulena!

3.

Kaikki on sinussa: aika,
ijäisyys, elämä, luonto,
isänmaa ja ihmiskunta,
siemen suurimman, vähimmän.
Itse riiput itsestäsi,
muista, minkä tahdot verran,
tie on tehty, määrä pantu,
vuori noustava: vapaus.

Kulje kohti korkeinta
oman onnes kukkulata,
täytä, minkä tiedät, tahdot,
täytät tahtoa jumalan,
nousten nostat taivonkantta,
painunet, eloa painat,
tulet taakka itsellesi,
muille pilvi päivän tiessä.

Mennen maailmat syleile,
astu kautta aikakautten,
tao päälles taistopaita
raudasta rakkaimman halusi,
hopeasta haavehesi,
kuparista kuolon uhman,
kullasta sydänkuvien,
piistä synkän itsepinnan.

4.

Laki ollos itsellesi.

Mieti, mik' on sulle hyvä,
tuumi, mik' on sulle paha,
ruma sulle, kaunis sulle:
ole maailma omasi.

Iske itsesi kipunat
yltä, alta, kaikkialta,
enin taistosta elämän.

***... It all can be
expressed in a
single slide.***

