

# INFORMATION, COMPUTATION, COGNITION: AN ETERNAL GOLDEN BRAID?

Moderator:

Terrence Deacon

Panelists:

Marcin Miłkowski, Gordana Dodig-Crnkovic, Peter Boltuc

Information, computation and cognition (as study of mind, and in the first place the human mind) have traditionally been considered as three different and independent phenomena.

They formed three academic fields of study addressed in research within Information (and communication) theory (as in the first place Shannon information and Algorithmic theory of information by Solomonoff, Kolmogorov and Chaitin), Computer science and its generalizations to Computing (predominant in the USA) or Informatics (predominant in Europe).

**Cognitive science** is an offshoot of human psychology and is literally the study of cognition, or thought. It includes language, problem solving, decision-making, and perception, especially consciously aware perception. Cognitive science started with those higher-level behavioral traits that were observable or testable and asked what is going on inside the mind or brain to make that possible.

**Neuroscience** is a branch of biology that began as the study of the anatomy and physiology of neural tissue. It grew out of clinical neurology and neurobiology, which evolved into neuroscience. Neurobiology concerns itself first and foremost with the observed anatomy and physiology of the brain, from major structures down to neurons and molecules. Neuroscience adds to that the study of how the brain works, mechanistically, functionally, and systemically to produce observable behavior.

Numerous connections between the three research fields have been successively established, through rapid development of Neuroscience, information and communication technologies, cognitive computing and artificial intelligence.

Especially intelligent information processing stands in the center of deep learning technologies that are promising revolutionary changes in the process of digitalization of society – shifting the focus from matter-energy to information as a primary way of controlling technological and social processes of knowledge generation and reality construction.

Panel will start with short, 5 minute pitches of each of panelists addressing the question of possible connections between information, computation and cognition. (20 minutes)

In the next step panel will discuss different views (20 minutes).

It will finish with the Q/A session in the dialog with the audience.