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JOINT SEMINAR

Determinism, Randomness and the Question of the “Free Will”

BY

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3:00pm – 4:00pm (Tea will be served)

SCT716, Science Tower, HSH Campus

Abstract

The existence of a “free will” has repeatedly been questioned since ancient times. In recent years, attacks against the “free will” specifically came from neuroscience. EEG recordings [1] as well as more recent fMRI data [2], have demonstrated that action related brain activity (readiness potentials, BOLD signals) occurs up to several seconds before an individual becomes aware about his/her decision to perform the action. As neuronal mechanisms are obeying physical laws it has been proposed that all decisions are fully determined already before the individuals become aware of those, only having the “illusion” of a free will.

“We do not what we want but we want what we do”. These conclusions from brain imaging data, controversially discussed [3, 4], will here be confronted with well known biophysical principles of neural processes, namely the stochastic opening and closing of ion channels [5]. In this context, emphasis will be laid on the understanding that evolution has introduced a particular type of randomness, far beyond the level of quantum mechanics, in making use of Brownian motion. This dynamic randomness (or “noise”) is principally unavoidable under all life compatible conditions. Although it is introduced already at the lowest levels of neuronal information processing it will not necessarily smear out at higher functional levels but even can be amplified by cooperative effects with the system’s nonlinearities [6,7].

The functional implications may be comparable or even go beyond the uncertainty theory in physics or the interplay between “chance and necessity” in evolution [6]. The question arises whether it is not despite but because of the principle randomness why biological systems are still more flexible and adaptable than any technical system so far – in this way eventually also providing the basis for flexible decision making.

Admittedly, randomness is not a proof of the “free will” but determinism, for sure, is not a good argument against.

References

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All Interested Are Welcome!