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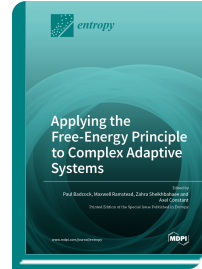


Special Issue Reprint

Applying the Free-Energy Principle to Complex Adaptive Systems

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The free energy principle is a mathematical theory of the behaviour of self-organising systems that originally gained prominence as a unified model of the brain. Since then, the theory has been applied to a plethora of biological phenomena, extending from single-celled and multicellular organisms through to niche construction and human culture, and even the emergence of life itself. The free energy principle tells us that perception and action operate synergistically to minimize an organism’s exposure to surprising biological states, which are more likely to lead to decay. A key corollary of this hypothesis is active inference—the idea that all behavior involves the selective sampling of sensory data so that we experience what we expect to (in order to avoid surprises). Simply put, we act upon the world to fulfill our expectations. It is now widely recognized that the implications of the free energy principle for our understanding of the human mind and behavior are far-reaching and profound. To date, however, its capacity to extend beyond our brain—to more generally explain living and other complex adaptive systems—has only just begun to be explored. The aim of this collection is to showcase the breadth of the free energy principle as a unified theory of complex adaptive systems—conscious, social, living, or not.



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